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ABSTRACT

This book offers a knowledge base for the integration of basic skills into vocational teacher education. Introductory materials include a project overview, mission and goals of the curriculum, belief statements, curriculum format, information on preparation and time issues, new basic skills definition, and a guide to lesson categories. The book contains three lessons: Conceptualizing Basic Skills; Models of Integration; and Keys to Integration. Each lesson format is identical, and each category within a lesson has its own icon, for ease in locating the category in any lesson. Lesson categories are as follows: (1) perennial problem (for this curriculum, what should be done about integrating the new basic skills into vocational education?); (2) practical problem (action that can help address the perennial problem); (3) justification for lesson; (4) learner outcome; (5) instructor resources; (6) teaching strategy modeled; (7) lesson plan (content, new basic skills, process, application objectives); (8) teaching-learning interaction (introduction and steps to guide the teacher educator through the lesson); (9) debriefing strategies (options for summarizing the lesson); (10) evaluation options; and (11) individualized learning plan. Handouts are provided at the end of each lesson. An instructor resources section at the end of the book contains transparencies and handouts suitable for photocopying. (YLB)

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VOCATIONAL
TEACHER
EDUCATION

Integrating
Basic Skills Into
Vocational Teacher
Education Curricula

THE INITIAL STEPS

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Integrating

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& Educational Studies
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THE INITIAL STEPS

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Integrating Basic Skills into Vocational Teacher and Counselor Education Curricula

PROJECT OVERVIEW

The goal of this project was to develop, field test, and disseminate curricula that would help preservice vocational education teachers and school guidance counselors learn how to integrate basic skills instruction into their work. One curriculum was designed for use by vocational teacher educators, the other for school guidance counselor educators.

The project staff followed four steps in developing these curricula. First, the staff developed field test materials with the help of two Working Group teams of national experts. (The Working Groups assisted throughout the project, identifying competencies, suggesting field test sites, recommending and helping to locate potential curriculum materials, reviewing materials chosen for inclusion in the curricula, and guiding the dissemination of draft curricula to field test sites.) Second, the project staff compiled two reviews of literature, one in vocational teacher education and the other in school counselor education, to help identify decisionmakers' current views on the importance of teaching basic skills to secondary and postsecondary students preparing to enter the workforce. Third, the project staff conducted site visits at nine vocational teacher education and nine school counselor education institutions. The Working Groups had identified these institutions as sites in which some emphasis was being given to basic skills in preservice curricula. Finally, the project staff used Working Group comments, the literature reviews, and the results of their site visits to produce draft sets of the two new basic skills curricula.

The project staff then field tested the draft curricula at nine teacher education and nine school counselor education institutions. (None of these were the same institutions at which site visits had been made.) At each field test location, project staff members worked with a Site Liaison to integrate the draft curricula into existing vocational teacher or school counselor education instruction. The project staff used the resulting field test reports to improve the lessons, formats, and teacher instructions of the new basic skills curricula.

Final versions of the two curricula have been sent to all site visit and field test locations and to major curriculum clearinghouses and teaching-materials dissemination sites. Information about the curricula has been sent to vocational and industrial teacher education programs and school counselor education programs nationwide. The procedures used in developing the curricula will be reported to major journals in vocational, counselor, home economics, industrial, and technology education. These procedures will also be summarized at presentations to state, regional, and national conferences in the same professional areas.

ACKNOWLEDGEMENTS

A United States Department of Education Contract through the Office of Vocational and Adult Education provided the funding for the development and production of this Integrating Basic Skills curriculum. The staff in the Office of Vocational and Adult Education provided valuable input and support. Special thanks for the leadership provided by Jackie Friederich, Richard Di Cola, Bernice Anderson, Laura Johns, Gisela Harkin, and Susan Webster.

Faculty and staff at Colorado State University, and particularly in the College of Applied Human Sciences, have been willing to provide necessary technical skills and assistance whenever needed throughout the contract. The School of Occupational and Educational Studies and the Department of Industrial Sciences were particularly instrumental in the success of this curriculum effort.

The Integrating Basic Skills curriculum was developed and written with guidance from experts in the field who have shown commitment and dedication to integrating basic skills into vocational education. We sincerely thank the members of our Working Group for their contributions. The members of the Teacher Education Working Group were: Kay Clayton, A & I University, Kingsville, TX; George H. Copa, University of Minnesota, Minneapolis, MN; Thomas H. Crumbaker-Smith, Boltz Junior High School, Fort Collins, CO; Jim Hubbard, Colorado Alliance for Science; Michael W. Neden, Delta County Schools, Delta, CO; Leno S. Pedrotti, Center for Occupational Research and Development, Waco, TX; L. Allen Phelps, University of Wisconsin—Madison, Madison, WI; Jane Plihal, University of Minnesota, Minneapolis, MN; and Sally Yahnke, Colorado State University, Fort Collins, CO.

Vocational teacher education programs at universities across the country assisted as visitation and field test sites. The input provided by both groups expanded and improved the final product. We are indebted to faculty, teachers, and students at the following institutions for the insights they shared.

Teacher Education Sites: Bemidji State University, Corpus Christi State University, Idaho State University, Illinois State University, Indiana University of Pennsylvania, Michigan Consortium, North Carolina Central University, Northwest Regional Educational Laboratory, The Ohio State University, University of California—Long Beach, University of Georgia, University of Maryland, University of Minnesota, University of Missouri, University of Wyoming, and Virginia Polytechnic Institute and State University.

During our site visit to the University of Maryland, Dr. Francine Hultgren shared the Perennial and Practical Problem approach used in the Home Economics Curriculum in Maryland. This was a turning point for our curriculum effort. We hope our curriculum model reflects the impact of Dr. Hultgren's work.

Dr. Donald Cruickshank, Professor Emeritus from The Ohio State University, graciously permitted us to use two Reflective Teaching Lessons. We hope that this curriculum project helps teachers and teacher educators reflect on their teaching in the manner which Dr. Cruickshank modeled so well.

The School of Occupational and Educational Studies at Colorado State University has an integrated faculty of vocational and general educators. The vocational teacher educators on this contract want to recognize the contributions of our general education faculty member, Dr. Barbara Nelson. Barbara's expertise in teaching models and lesson planning enhanced the curriculum and increased our commitment to the integration of vocational and general teacher education.

The leadership, guidance, and support provided by Dr. R. Brian Cobb, Project Director, facilitated our work on the project. Dr. Nancy Hartley and Dr. Jaime Stefan, Project Coordinators, kept progress running smoothly as we traveled and wrote. Dr. Joseph Daly and Dr. Rich Feller provided insights into the counselor's role in integration as we worked as an integration team.

In the two years in which we have been working, many people have been an important part of this team effort. Staff, graduate students, and student workers have contributed time and energy. Special thanks to: Len Albright, Bart Beaudin, Betty Bloom, Sheila Bowman, Lynn Butler, Susan Cipolla, Barbara Cisneros, Terry Deniston, Jackie Friederich, Jody Gerst, Betty Grant, Stephen Jaouen, Nathalie Kees, Katy Koenen, Jean Lehmann, Jon Lewis, Jeff Lovejoy, Dawn Mallette, Carmen Manning, Laura McIntyre, Fawn Milliken, Laura Myers, Kathy Phifer, Laurie Pierce, Tracey Seltzer, Dee Spaulding, John Sutton, Janet Trever, and Ron Warren. We appreciate the efforts of each of you.

Cathleen T. Love and Gene W. Gloeckner

MISSION AND GOALS

Mission Statement

The mission of this vocational education curriculum is to empower preservice teachers with the skills necessary to model, plan, and facilitate the acquisition of the new basic skills necessary for learners to be successful family members, workers, and learners.

Goals

- To develop understanding of the new basic skills.
- To generate integrated efforts to assist learners in achieving new basic skills.
- To develop understanding of the multiple roles learners play in their work, family, and educational lives.
- To promote public school teachers as leaders in school reform.
- To develop an appreciation of the forces affecting change in the public school system.
- To model through the teacher education program the integration of basic skills into the curriculum.

Perennial Problem

What should be done about integrating the new basic skills into vocational education?

BELIEF STATEMENTS

The following beliefs guided the development of the curriculum.

We Believe:

- The teacher is no longer a "walking encyclopedia." The teaching-learning model no longer resembles an assembly line in which the student enters kindergarten and progresses through the system in a "linear" fashion with "parts" being added to create a complete product. Instead, the teaching-learning model focuses on integrating content and process so that the teacher is a facilitator of learning.

- It is the responsibility of vocational teachers to assume a leadership role in the facilitation of the change process from the assembly line model to an integration model.

- The vocational teacher educator is a role model for the preservice teacher in curriculum areas such as these: the teaching of basic skills, teaching methods and content, evaluation techniques, and the value placed on positive learner outcomes.

- The preservice teacher is capable of developing the basic skills, teaching methods and content, and evaluation techniques necessary to facilitate positive learner outcomes in the vocational classroom.

- The vocational teacher must have ownership of the new basic skills to model those skills.

- Debriefing of each lesson is key to enabling the preservice teacher to internalize the concepts of the lesson.

- Learning to know must never be separated from learning to do. Knowledge is derived from both content and process. The acquisition of knowledge requires the active participation of the learner. Knowledge is dynamic, it is continuously reconstructed by the learner, and it is affected by constant change.[1]

- The aim of education is to develop individuals who are active participants in the acquisition of knowledge and in the formation of healthy systems in a democratic society.

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[1]Adapted form Hultgren, F. (Project Director). (1989). A conceptual guide framework for home economics curriculum in Maryland. College Park, MD: University of Maryland.

CURRICULUM FORMAT

The curriculum has been organized into five books and a review of literature. The review of literature can be used as an instructor resource in preparing to teach this curriculum and/or as a reading for students.

Each lesson developed for the vocational teacher education Integrating Basic Skills curriculum was written to stand alone. No lesson requires that students have participated in a prior lesson in the curriculum to understand the lesson you choose to teach. However, Book One, The Initial Steps, offers a knowledge base for the integration of basic skills if your students are unfamiliar with the concept.

The chart which follows summarizes the five curriculum books. The titles of the lessons in each book are provided in the second column. The last column states the practical problem that each lesson addresses.

Teacher Education Curriculum

BOOK	LESSON	PRACTICAL PROBLEM
One: The Initial Steps	Conceptualizing Basic Skills	What should be done to help teachers own the new basic skills?
	Models of Integration	What should be done to help teachers own integration?
	Keys to Integration	What should be done to promote the integration process and help remove the natural competitive barriers within schools?
Two: Changing Attitudes	Affective Domain: Changing Attitudes	What should be done to help teachers better understand how to assess student attitudes?
	Lifelong Learning	What should be done to help motivate future teachers to maintain their quest for knowledge and to broaden their concept of education beyond classroom learning?
	Student/Teacher Expectations	What should be done to help teachers recognize how student and teacher expectations affect learning?

BOOK	LESSON	PRACTICAL PROBLEM
Three: Reality of Learners	Social Conditions of Youth	What should be done to help teachers understand how societal conditions and stereotyping affect youth in the public schools?
	Learning Styles	What should be done to help teachers respond to the learning style differences of their students?
	Special Populations	What should be done to help teachers facilitate the success of *all* students in their classrooms?
	Teaching the Adult Learner	What should be done to help teachers better understand the needs of the adult learner?
Four: Change in the Public School	School Reform	What should be done to help teachers understand the school reform movement?
	Rules, Roles, and Relationships in Schools	What should be done about "turf" issues between vocational and academic education?
	Dynamics of Change	What should be done about recognizing the impact of information age technology on the learner's preparation for work, family, and further education?
	Partnerships: Involving the Community	What should be done to help teachers build relationships with healthy boundaries for themselves and others?
Five: Challenges for the Teacher	The Curriculum Challenge	What should be done to help teachers accept change as a constant in curricula?
	School Culture	What should be done to facilitate integration of the new basic skills given the power structure that exists in the public schools?
	Modeling Integration of Work and Family	What should be done to help teachers recognize how making personal lifestyle choices requires similar skills as making professional choices?

A similar set of materials has been produced by Dr. Richard W. Feller and Dr. Joseph L. Daly in the area of School Counselor Education. All materials are available by writing to: School of Occupational and Educational Studies, Education Building, Room 209, Colorado State University, Fort Collins, CO 80523.

PREPARATION AND TIME ISSUES

Preparation Time

Faculty who field tested these materials recommend **at least one hour** of preparation for each lesson. Although you are acting only as a facilitator in these lessons, the content and teaching strategy may be new and/or different. Taking the time to prepare will foster delivery of both the content and process. It is particularly important to note that some lessons have an assignment that must be given to students the day prior to the lesson.

Each lesson contains a list of the materials needed to teach the lesson, and copies of any transparencies or handouts which are part of that lesson. Be sure to check for any additional teaching materials, e.g., audiovisual equipment, flipcharts, etc., which are needed to facilitate the lesson.

Time For Lesson Plan Delivery

In the field testing of the curriculum, these lessons were offered in classes which ranged in time from one to three hours. The students who were part of the field testing were adamant about the need to allow students time to discuss the topics in each lesson. Often the discussions were seen as critical to the lesson impact.

Lesson content and process throughout this curriculum are driven by the needs and interests of the students. You know the unique needs and interests of the students with whom you are working. As you review the lesson, think about the time your students will need to experience the lesson, and divide the steps in the Lesson Plan into time allotments which meet the needs of your students.

Transparencies and Handouts

Transparencies and handouts are duplicated at the end of each book, in the Instructor Resources section. The transparencies and handouts can easily be pulled out of this section and photocopied.

NEW BASIC SKILLS DEFINED

Basic skills are often defined as skills that were once referred to as the academic skills of reading, writing, and arithmetic. However, studies conducted during the last decade have focused on a broader definition of basic skills. The lack of these "new basic skills" has been associated with America's decline in productivity.

As part of the U.S. Department of Education project that funded the development of this curriculum, an extensive literature review was completed: Integrating Basic Skills into Vocational Teacher Education Curricula: Review of Literature, (Gloeckner, G., Cobb, B., Love, C., & Grant, B.).[2] One goal of the literature review was to provide an operational definition of the "new basic skills" for vocational teacher education. The authors sought to answer the question, *What knowledge and principles in liberal arts and occupational skill training help lead to success in work, family, and education?* The literature supported ten categories of new basic skills. In this curriculum, the new basic skills are defined as the knowledge and skills associated with these ten categories:

1. Learning to Learn
2. Reading, Writing, and Mathematics
3. Communication
4. Adaptability (creative and critical thinking and problem solving)
5. Personal Management (self-esteem, goal setting/motivation, and personal/career development)
6. Group Effectiveness (interpersonal skills, negotiation, and teamwork)
7. Influence (organizational effectiveness and leadership)
8. Technology
9. Science
10. Home/Family Management and Relationships

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[2]Copies of the complete literature review are available from: School of Occupational and Educational Studies, Education Building, Room 209, Colorado State University, Fort Collins, CO 80523.

GUIDE TO LESSON CATEGORIES

Each lesson format is identical, and each category within a lesson has its own icon, for ease in locating the category in any lesson. Lesson categories are described below.

Perennial Problem

A Perennial Problem is one faced over and over by successive generations of teachers. Perennial Problems include enduring questions about how to improve the quality of education. Posing curriculum lessons as Perennial Problems avoids focusing on time-specific problems. Developers of this curriculum have used the Perennial Problem approach throughout the curriculum. This approach provides a convenient framework for addressing issues involved in integrating new basic skills into vocational education.

The Perennial Problem informing this curriculum is: **What should be done about integrating the new basic skills into vocational education?**

Practical Problem

A Practical Problem identifies an action that can help address the Perennial Problem. This action is born of reasoned thought and sound judgment. Posing a Practical Problem in a curriculum is a way of focusing on both affective and cognitive processes, on both knowledge and values, on life experiences, and on thought and action. The Practical Problem approach can be used to help analyze a teaching situation, identify and address an education dilemma, generate and critique alternatives, and make value judgments.

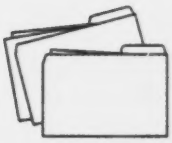
Justification for Lesson

To develop this curriculum, teachers integrating the new basic skills into vocational education were asked the question, "What would you have liked to have studied/discussed in your preservice education that would have prepared you to do a better job of integrating these skills into your work?" Their responses framed the lessons developed. The Justification for Lesson describes the contribution each lesson can make

in preparing teachers for integrating the new basic skills into vocational education.

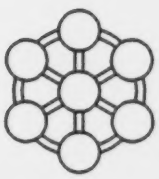
Learner Outcome

A Learner Outcome is a competency, level of knowledge, or quality that students should be able to demonstrate when they complete the lesson. Outcome-based education requires organizing the curriculum so that all students can reach the outcome. It demands a different approach to pedagogy, with emphasis on active modeling, expecting success, intensive engagement, diagnostic assessment, and frequent feedback to students.



Instructor Resources

This section lists all materials and supplies needed for the lesson, and gives guidelines for copying, adapting, and distributing necessary resources.



Teaching Strategy Modeled

Because knowledge is derived from both content and process, the teaching strategy modeled in the delivery of each lesson is critical to the expected outcome. A short synopsis of the "what," "why," "when," and "how" for each strategy is provided as a handout in each lesson. If you are unfamiliar with the teaching strategy, there is a source given on the handout for further exploration.

Lesson Plan

The Lesson Plan provides the content, new basic skills, process, and application objectives for each lesson. The step-by-step delivery of the lesson is given in the Teaching-Learning Interaction and the Debriefing. The final part of the Lesson Plan offers options for evaluation.

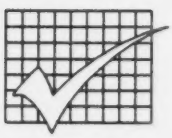
Teaching-Learning Interaction

The Teaching-Learning Interaction is the heart of the Lesson Plan. It includes an introduction and a series of steps to help guide the teacher educator through the lesson.

Debriefing Strategies

Debriefing Strategies are options for summarizing the lesson. In teacher education classes, students need the opportunity to discuss the content learned and the process (teaching strategy) in which they learned it. In addition, students are given the opportunity through debriefing to analyze what new basic skills they were practicing while participating in the lesson.

Debriefing helps education students critically examine how this lesson applies to their role as vocational teachers. Debriefing is an important part of the Lesson Plan. Planning time for debriefing is essential.



Evaluation Options

Evaluation Options for each lesson are based on the lesson's content, process, and application objectives. These options are meant to be adapted to meet the needs of your students.

Individualized Learning Plan

The plan for individualizing the lesson was provided by field test sites with individualized programs. The demonstration of competency required in the Individualized Learning Plan is the teaching of the lesson to a designated group.

CONCEPTUALIZING BASIC SKILLS

Perennial Problem

What should be done about integrating the new basic skills into vocational education?

Practical Problem

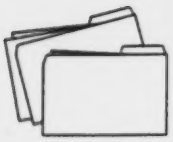
What should be done to help teachers own the new basic skills?

Justification for Lesson

There seems to be a great deal of confusion regarding the definition of basic skills. This lesson is designed to help teachers understand the complexity of arriving at a universal definition, and to help them create their own intellectually defensible definition of basic skills.

Learner Outcome

The learner will formulate a working list of the new basic skills which is personally and intellectually defensible.

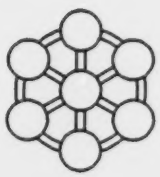


Instructor Resources

Handouts:
- Brainstorming Strategy
- Consensus Strategy
- "New Basic Skills" (seven-page article)

Transparencies:
- Consensus Strategy
- The New Basic Skills
- Conceptual Framework for Basic Skills

Supplies:
- Paper, board, flip chart, or other display devices for groups
- Markers, chalk, or other input devices



Teaching Strategy Modeled

Consensus Strategy

LESSON PLAN

Objectives:

Content:
The learner will formulate a list of new basic skills which is personally and intellectually defensible.

New Basic Skills:
The learner will identify the new basic skills experienced in this lesson.

Process:
The learner will be able to evaluate consensus as a teaching strategy.

Application:
The learner will relate the new basic skills and the Consensus Strategy to a lesson in his or her content area.

Teaching-Learning Interaction

Introduction:

Before you as teachers can integrate the basic skills into your curricula, you need to be able to define the basic skills. The lesson today will help you do so. Additionally, you will experience a teaching technique called the Consensus Strategy.

CONSENSUS STRATEGY

Problem: "What are the new basic skills?"

A. Brainstorm Possible Solutions
   no evaluation
   be creative
   record all responses on newsprint

B. Evaluate the Solutions
   review all ideas
   come to consensus on what constitutes the new basic skills

C. Make a Decision
   write down agreed-upon decision

Transparency 1

Learning Activities:

Step 1:

Identify individually what outcomes or basic skills you want students to possess upon graduation from high school. As an example, high school graduates should be able to read. What other basic skills should high school students possess?

Step 2:

Review rules for brainstorming as summarized on the handout titled Brainstorming Strategy. Randomly divide the large group into smaller groups of 2-6 students. Show the transparency titled Consensus Strategy. Review the steps of the Consensus Strategy on the transparency. Have small groups solve the problem presented on the transparency.

The New Basic Skills

Learning to Learn
Reading, Writing, and Mathematics
Communication
Adaptability: *Creative and Critical Thinking, Problem Solving*
Personal Management: *Self-Esteem, Goal Setting/Motivation, Personal/Career Development*
Group Effectiveness: *Interpersonal Skills, Negotiation, and Teamwork*
Influence: *Organizational Effectiveness and Leadership*
Technology
Science
Home/Family Management and Relationships

Transparency 2

Step 3:

Small group work.

Step 4:

Have each small group share one basic skill. Repeat this process until the groups have exhausted their lists or basic skills begin to be repeated.

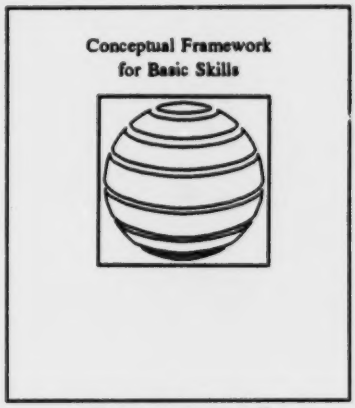
Step 5:

Show the transparency titled The New Basic Skills. Discuss differences and similarities between the class list and the transparency.

Teaching-Learning Interaction, continued

Step 6:
Show the transparency titled Conceptual Framework for Basic Skills.
Ask the following questions:

1. Does your list of basic skills lead to success in family living, work, and future education?
2. Do learners acquire your list of Basic Skills in liberal arts and vocational education?



Transparency 3

Debriefing Strategies

Content:
Ask the following questions:

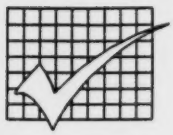
1. Where did your ideas come from?
2. What values are reflected in the new basic skills?
3. Who should determine what basic skills are taught or emphasized in the high school curriculum?
4. Who *does* determine what basic skills are taught or emphasized in the high school curriculum?

New Basic Skills:
During the lesson today, what new basic skills did you experience?

- Group effectiveness
- Influence
- Communication
- Writing and Reading
- Adaptability

Process:
Distribute the handout titled Consensus Strategy. Reflect on the following:

1. What did you like/dislike about using the consensus model as a teaching strategy?
2. What are the advantages/drawbacks to this approach?
3. Some decisions can be made by majority rule. Are there situations where consensus is important?



Evaluation Options

Content:
Assignment: Distribute the handout titled New Basic Skills. Using the three sources of basic skills information (individual perceptions, group perceptions, and the handout New Basic Skills) formulate a list which you find personally and intellectually defensible.

1. Provide a brief rationale for your choices.
2. Describe how others influenced your decision.
3. Develop a lesson plan that teaches several of the "new basic skills."

Process:
Develop a lesson in your area of expertise which employs consensus as the teaching strategy.

Application:
Observe a class. Identify the new basic skills which the students are experiencing.

Individualized Learning Plan

If a student is learning this content in an individualized program, the student should be given the entire lesson. The student should read all materials. The college supervisor will designate which Evaluation Options will be required of the student. To demonstrate competency, the student should prepare to teach the lesson to a group designated by the college supervisor. Suggestions for such groups include: teacher groups, service organizations, youth groups, etc.

Brainstorming Strategy

Brainstorming

Step 1: Gather a quantity of ideas on any subject without considering quality. (No ideas are to be criticized.)

Write ideas down (on board, overhead, etc.) where they can be seen by all.

Step 2: Participants vote to determine which of the ideas they like best (usually choosing two to three of those gathered).

Step 3: Discuss the top two to three choices in detail; the advantages and disadvantages of each should be explored.

Step 4: Take a final vote to establish the *one* idea that is liked best.

Small Group Brainstorming

Follow the same procedures listed above, with these exceptions:

Each group may present the two or three ideas it considers its best.

After all groups' ideas are listed, an elimination process may be carried out with a vote by all.

- Brainstorming is not designed for use in situations that point obviously to one best solution.
- The outcome is not predetermined by the teacher or leader.
- The group works together democratically to arrive at *a* solution, not *the* solution.

Reference

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Consensus Strategy

What is the Consensus Strategy?

The Consensus Strategy is a decisionmaking strategy in which the group aims to arrive at decisions acceptable to all, rather than imposing the will of the majority on the minority.

Why use the Consensus Strategy?

The Consensus Strategy can make everyone a "winner" in the decisionmaking process because the views of all members of the group are considered. In addition, it is a technique which generates positive feelings and builds an atmosphere of mutual respect.

When should you use the Consensus Strategy?

Teachers can use the Consensus Strategy whenever it is important that all involved agree on a decision, solution, or plan of action.

How to use the Consensus Strategy.

The steps in consensus follow:

Brainstorm Possible Solutions.

1. It is important in brainstorming to keep from evaluating the proposals; all ideas should be accepted without requiring editing, clarification, or justification. The facilitator should encourage even "wild" or unique solutions.
2. Record all solutions (tape recorder, chalk board, newsprint) and keep things moving as quickly as possible. When the process lags, ask a refocusing question such as, "What are ways no one has thought of yet?"

Evaluate the Solutions.

1. Only when you have developed a good list of possible solutions is it appropriate to evaluate.
2. As a group, determine which solutions are the best. Cross off the list any solutions which get a negative rating from anyone for whatever reason.
3. It is important that all opinions and preferences be heard and respected. Everyone should be encouraged to advocate their proposals and to explain why their ideas have merit. Take the time to let everyone participate.

Consensus Strategy, continued

Make a Decision.

1. In some cases a clearly superior solution emerges and everyone agrees. Often, however, several high-quality solutions remain.
2. While you may take a straw vote to find out "where people are," it is important that the group not use the democratic process where "majority rules." Unless the vote is unanimous, voting produces winners and losers, and the losers will be poorly motivated to carry out the decision.
3. In exploring the proposed solutions, test them by asking participants to imagine how each solution would work if it were chosen.
4. Remember that the goal is consensus. Do not adopt a solution until everyone agrees to at least try it.
5. Write down the agreed-upon solution.

Determine How to Implement the Decision.

1. Ask the following questions: What do we need to get started? Who will be responsible for what?
2. Consider standards of performance. For example, what is a clean room?
3. Determine a time when the success of the solution will be assessed.

Solutions should allow everyone to get their needs met. When a solution fails to do so, it should be discarded and another one sought. Also, sometimes solutions to one problem create new problems, or the solutions only work for a while, so periodic assessment may be important. Remember that it is OK for a solution to fail.

Reference

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New Basic Skills[1]

The term "basic skills" has different meanings for different people (Dunn, 1988). It often has political currency (Miguel, 1985) with employers using the term loosely to mean a variety of work-readiness and work-related sets of skills. Basic skills are often defined as skills that were once referred to as the academic skills of reading, writing, and arithmetic (Dunn, 1988; Applying the Academics, Delaware State Department, 1989; Miguel, 1985; Owens, 1988; Strumpf, 1986; Pritz, 1988; Lee, 1988). In addition to the previously used academic definition, basic skills are also now cited as those social competencies such as the ability to balance a checkbook or read safety instructions (Dunn, 1988). Other uses of the term "basic skills" include the work attitudes found in successful workers, such as being dependable, responsible, coming to work on time, and being able to get along well with co-workers (Semple, 1987).

The literature reviewed is full of reports describing a whole new set of skills now considered to be basic. A major study by the United States Department of Labor and the American Society of Training and Development (Carnevale, Gainer, & Meltzer, 1988) documents the following as basic skills: (a) learning to learn; (b) reading, writing, and mathematics; (c) communication; (d) adaptability (creative and critical thinking and problem solving); (e) personal management (self-esteem, goal setting/motivation, and personal/career development); (f) group effectiveness (interpersonal skills, negotiation and teamwork); and (g) influence (organizational effectiveness and leadership).

Most literature on basic skills falls naturally into one or more of these categories. However, other key documents indicate a need for additional categories. For example, a more recent study funded by the U.S. Department of Labor (SCANS, 1991) includes technology as one of five key areas of basic skill competence needed by individuals in America's workplace.

Science is yet another category that appears in the literature (Knold, 1986; Bishop, 1985). Documentation focuses on the need for all Americans to have a basic understanding of science. Thus, technology and science are added as the eighth and ninth categories.

Finally, the theory of the nature of knowledge suggests a need for specific emphasis on balancing family pressures with those of education and work (Way, 1991; Kline & Cowan, 1989). Although the nine previous categories all assist in success in home and family, the literature, particularly in these two disciplines, necessitates the addition of a tenth and final category, home/family management and relationships.

The categories of basic skills reviewed in the remaining pages of this article, then, are organized around the following ten categories: (a) learning to learn; (b) reading, writing, and mathematics; (c) communication; (d) adaptability (creative and critical thinking and problem solving); (e) personal management (self-esteem, goal setting/motivation, and personal/career development); (f) group effectiveness (interpersonal skills, negotiation, and teamwork); (g) influence (organizational effectiveness and leadership); (h) technology; (i) science; and (j) home/family management and relationships.

Learning to learn. Workers must be able to assimilate new information, adapt to new technologies and prepare to be

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[1]Gloeckner, G., Cobb, B., Love, C., & Grant, B. (1992). Integrating basic skills into vocational teacher education curricula: Review of literature. Fort Collins, CO: Colorado State University.

occupationally mobile (Zuga & Lindstrom, 1989). As competition forces American industry into new patterns, workers will be required to shift from one job role to another and accept changing responsibilities. Workers will be required to absorb, process, and apply new information quickly and effectively (Carnevale et al., 1988; Champagne, 1986).

Increasingly, individuals must have a high level of integrated basic skills -- skills which reinforce each other and can be applied to changing conditions. Students will need integrated basic skills at work and elsewhere to be successful in the future (Chisman, 1989).

The ability to learn new skills is becoming more and more important (Miguel, 1985). People will need new skills in the workplace every two to three years. Learning to acquire new skills gives the worker the ability to adapt (Blai, 1989) and solve problems (Crismore & Mikulecky, 1987). Workers need to consider education as a continuous process throughout a working lifetime (Ten Recommendations for Improving Secondary Vocational Education, 1985; Champagne, 1986). Learning to learn adds transition skills which provide the ability to move easily from one occupation to another (Patterson, 1985). Learning to learn is the most basic of all skills. It is the key to unlocking future success.

Individuals who have the skill to learn and apply new skills interactively can achieve competency in all other skills from basic reading to leadership (Carnevale et al., 1988; Champagne, 1986). Learning to learn proficiency appears to be acquired through experiences within the total educational curriculum (Foodservice Subject Matter Update, 1986-87). A program with learning to learn as a priority would include a liberal arts education of reading, literature, writing, mathematics, social studies, and science. The program would also emphasize the ability to start, continue, and complete tasks within a given time (Patterson, 1985).

Reading, writing, and mathematics. Although the skills required by the workplace of the future are more complex than in previous eras, the abilities to read, write, and compute are still essential. New requirements for reading, writing, and computation, however, go beyond simple functioning. The worker will have to have the capacity to perform in the increasingly complex atmosphere of the workplace (Buskirk, 1988).

Communication. Communication skills reflect how well individuals get along and how effectively they communicate with their peers (Semple, 1987). Communication involves both verbal and nonverbal forms of communication, written expression, comprehension, speaking, listening, conversation giving, receiving instructions, and attending to others in a positive way (Fitzgerald, 1986; Carnevale & Johnston, 1989; Carnevale & Gainer, 1989a; Ten Recommendations, 1985; Bailey & Novelle, 1989; Carnevale et al., 1988). Generally, people communicate by listening and speaking. People spend a great deal of their day in some form of communication. The average person spends "8.4 percent of their time writing, 13.3 percent reading, 23 percent speaking, and 55 percent listening" (Semple, 1987, p. 11). The ability to express oneself clearly to others and listening carefully and actively are important worker competencies (Patterson, 1985). Success on the job is linked to good communications; only job knowledge ranks higher as a factor in workplace success (Semple, 1987; Welter, 1989; Carnevale et al., 1988).

Although interaction is used frequently in communication, today's employees must also develop the ability to write. Writing relies on skill abilities in the areas of analysis, conceptualization, synthesis, and distilling of information. The shift in writing skills is one from long compositions to clear, concise articulation of points and proposals (Carnevale et al., 1988).

Adaptability (creative and critical thinking and problem solving). As workers become more autonomous within the workplace (Blai, 1989), adaptability becomes more necessary. Creative and critical thinking and problem solving provide a process for making well-considered decisions. Workers will need to have the ability to generate alternatives, project outcomes, assess probabilities, and take action and risks (Carnevale et al., 1988).

Problem solving and critical and creative thinking skills include the abilities to plan, analyze, synthesize, evaluate, organize, and manage information (Patterson, 1985), and to set priorities for determining alternatives (Fitzgerald, 1986). Problem solving requires knowledge and understanding of the processes needed to apply knowledge. These skills provide the worker with the ability to detect a problem, find or invent the solutions, choose the most appropriate solutions for the conditions, and track and evaluate results (Crismore & Mikulecky, 1987).

Personal management (self-esteem, goal setting/ motivation and personal/career development). Dramatic changes in the workplace have made personal management an essential skill (Welter, 1989; Carnevale & Gainer, 1989; Berryman, 1988). Workers with these skills have the tools for understanding and expanding their skills inventories, can manage change, and are more productive in their work (Carnevale & Johnston, 1989; Pucel, Devogel, & Persico, 1988).

As the workplace continues to change and as workers become more autonomous (Blai, 1989), the need for workers to have a well developed and positive sense of self-esteem becomes critical. Self-esteem allows workers to develop confidence in their ability to do the job and to adjust as conditions change around them.

> Key components of self-esteem training include assisting employees to recognize their current skills; being aware of their impact on others; understanding their emotional set points and abilities to cope with stress, change, criticism, and so on; and dealing with their own limits by recognizing the need for and seeking new information to apply to problems and construct solutions. (Carnevale et al., 1988, p.13)

Workers with personal management skills have the awareness of themselves as individuals with talents and abilities which are marketable. They recognize the need for adding to their skill inventory and can be pro-active in dealing with the frustrations of the workplace. This skill becomes increasingly important with the increased complexity and changing demands of the workplace. Lack of these skills is often the root cause of other problems such as errors and absenteeism.

Group effectiveness (interpersonal skills, negotiation, and teamwork). Group effectiveness is the ability to work cooperatively with others (Buskirk, 1988; Carnevale & Johnston, 1989). The ability to interact with others effectively is critical when working in teams. It also is essential for service industry occupations which deal with customer complaints (Carnevale & Johnston, 1989).

As the industry increases the use of worker teams, skills in group effectiveness become increasingly important (Executive Report of the Jobs for Indiana's Future, 1989). This large category of competencies is composed of interpersonal skills, negotiation, and teamwork. Conflict is a natural condition resulting from individual differences in values and opinions. As workers are placed into more teaming situations, or as downsizing of middle management occurs, the resolution of conflict often falls to the individual worker.

Today, workers must get along with others, deal with pressures to get the job done,

follow rules and policies, and have a good work attitude (Fitzgerald, 1986). These skills include such activities as attending to others in a positive way (Fitzgerald, 1986), resolving conflict, managing stress, establishing networks with others (Patterson, 1985), and group interaction (Bailey & Novelle, 1989).

Group effectiveness skills are considered the cornerstones of successful teamwork (Carnevale et al., 1988). Due to the pooling of resources in most industries, workers are being asked to perform a multiplicity of tasks. To perform these tasks, workers must have an array of skills that individual or routine jobs do not require (Carnevale et al., 1988). Successful performance in work settings that require autonomous teams depends upon the worker's ability to interact, defuse conflict, and develop a sense of group purpose (Carnevale et al., 1988). Plihal (1989) referred to the ability to reach consensus as the "ideal speech situation" which is "characterized by freedom, equality, and openness" (p. 41).

Influence (organizational effectiveness and leadership). Influence refers to the impact of a member upon an organization. It is made up of organizational effectiveness (the ability to understand how the parts of that organization function together) and leadership (the ability to make one or many of those parts function smoothly). Workers need to have a sense of how their actions affect the ability of the organization to meet its goals (Carnevale & Johnston, 1989).

All organizations have a culture. The culture of the organization and the workers' ability to function within that culture becomes as important as specific job skills held by the worker (Carnevale et al., 1988). Armed with an understanding of what the organization values and how that is operationalized, workers will be able to become fully functioning, productive, and empowered members (Carnevale et al., 1988). Once a worker understands the organization's culture, then leadership skills can be used in positive and productive ways. To remain competitive, industry needs its employers to be able to operate within the organization and to assume responsibility and motivate others (Carnevale et al., 1988).

Technology. The Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) lists technology as one of the five key competency areas needed for the year 2000. SCANS includes three competency areas related to technology: selecting technology, applying technology to a task, and maintaining and troubleshooting equipment. Project 2061: Science for All Americans, (AAAS, 1989) identifies technology as a key area of knowledge for this and upcoming generations. It is important that technology be an integral part of the future of education for competing in a global economic environment (National Research Council, 1989; AAAS, 1989; Durenfurth & Kozak, 1991; SCANS, 1991).

Science. It was surprising to discover that many of the frequently cited national reports excluded science as a discrete category of basic skills. This review has relied heavily upon the Carnevale et al. (1988) conception of basic skills. Indeed this source is often cited by others as an exemplary "basic skills document." Given the credibility of this work it was surprising to learn that the word science is not included in the index. Similarly, the SCANS (1991) report omits science as a competency area.

Reports that omit science as an overarching competency area often include many of the competencies traditionally associated with science, such categories as: critical thinking, problem solving, interpreting, and evaluating. In an interesting contrast, other national reports focus on science as the key missing component in the United States' reduced ability to compete in a global market (AAAS, 1989; Knold, 1986; Bishop, 1985). For these reasons, science is one of the key terms that this review uses to categorize what is meant by basic skills.

Home/Family Management and Relationships. Data from the past five years emphasize the interrelationship between success at home and success at the workplace (Way, 1991; Kline & Cowan, 1989). Family and work are intertwined in nearly every basic skill area previously identified.

Personal management is directly related to family management (Goldsmith, 1989). Group effectiveness, influence, adaptability, communication skills, and the love of learning all begin in the home (Goldsmith, 1989). Similarly, interest in the content areas of technology, science, reading, writing, and mathematics begins in the home (Felstehausen & Schultz, 1991). For these reasons, and due to the fact that basic skills lead to success at home, in the workplace, and in education, this last category is included as part of the operational definition of basic skills.

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MODELS OF INTEGRATION

Perennial Problem

What should be done about integrating the new basic skills into vocational education?

Practical Problem

What should be done to help teachers own integration?

Justification for Lesson

The term "integration" is used in a variety of contexts in education. The purpose of this lesson is to help future teachers define and understand different models of integration.

Learner Outcome

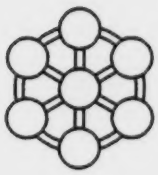
The learner will evaluate models of integration.

Instructor Resources

Handouts:
- Expert Sheets for each Expert Group member (Models 1 through 7)
- Expert Sheet Content Review Sheet
- Expert Sheet Content Review Sheet Answer Key
- "Models of Integration" (nine-page article)
- Jigsaw Teaching Strategy

Transparencies:
- Jigsaw II

Supplies:
- Assorted teaching supplies for expert groups (e.g., paper, transparencies, markers, etc.)



Teaching Strategy Modeled

Jigsaw II Strategy

LESSON PLAN

Objectives:

Content:
The learner will evaluate models of integration.

New Basic Skills:
The learner will identify the new basic skills experienced in this lesson.

Process:
The learner will be able to identify the benefits of the Jigsaw II Strategy.

Application:
The learner will be able to identify models of integration in practice.

JIGSAW II

Have students "count off" into the size of groups appropriate for your class. As an example, if you have 25 students (5 groups of 5), have students count 1 through 5. Group 1s together, 2s together, etc. These will be your expert groups.

EXPERT GROUPS

11111 22222 33333 44444 55555

After Expert Groups have prepared their content, students re-group across Expert Groups. Have them report to their Cooperative Teams.

COOPERATIVE TEAMS

12345 12345 12345 12345 12345

Transparency 1

Teaching-Learning Interaction

Day Prior to Lesson:

1. Give the class an overview of Jigsaw II Strategy using the transparency, Jigsaw II.
2. Divide the class into equal size groups. In small classes you will need to assign more than one Expert Sheet to the Expert Groups.
3. Distribute one (or two for small classes) Expert Sheet(s) to each group. Each Expert Group should have a different Expert Sheet.

Teaching-Learning Interaction, continued

4. Distribute Models of Integration handout. Remind students of their responsibility to read the handout and review the Expert Sheet(s) assigned to them.

Introduction:
Students meet in Expert Groups to prepare for teaching their models. Encourage students to be creative in their teaching technique.

Learning Activities:
Step 1:
Regroup students into their cooperative teams as shown on the Jigsaw II transparency and have them teach their models.

Step 2:
Hand out the Content Review Sheet. Ask students to match the model with the abbreviated descriptions given.

Grade papers.

Sum the individual scores of the cooperative group and divide by the number of students in the group, thus obtaining the mean score for each group.

Ask the following questions:
1. Which group did best?
2. Which creative methods of remembering the models worked best?
3. What would your group do differently to increase group attention?

Debriefing Strategies

Content:
Ask the following questions:

1. How are the models of integration similar and different?
2. How can these models assist you in becoming a more effective teacher?
3. What are key factors that promote integration of vocational and academic education?

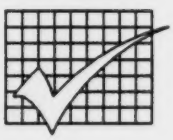
Debriefing Strategies, continued

New Basic Skills:
During the lesson today, what new basic skills did you experience?

- Reading
- Group effectiveness
- Communication skills
- Adaptability

Process:
Distribute the handout Jigsaw Teaching Strategy and ask the following questions:

1. What did you like/dislike about the Jigsaw II Strategy?
2. What are the advantages/disadvantages of this approach?



Evaluation Options

Content:
Choose an integration model which fits your personal and professional beliefs. Write a one-page defense of your choice. Include a paragraph on the factors, forces, or people which influenced your decision.

Process:
1. Your Expert Team should submit the teaching tools and lesson plans it developed.
2. Design a lesson in your area of expertise incorporating the Jigsaw II Strategy.

Application:
Visit secondary and/or postsecondary vocational programs in the community where a model for integration is being developed. Students may choose to:

1. Connect models discussed in class with those observed.
2. Interview key players (academic and vocational teachers, students, etc.) about the process of integration.

Individualized Learning Plan

If a student is learning this content in an individualized program, the student should be given the entire lesson. The student should read all materials. The college supervisor will designate which Evaluation Options will be required of the student. To demonstrate competency, the student should prepare to teach the lesson to a group designated by the college supervisor. Suggestions for such groups include: teacher groups, service organizations, youth groups, etc.

EXPERT SHEET

Model 1: Incorporating Academic Competencies into Vocational Coursework

This model is designed to insure that the vocational course establishes and maintains academic standards. It incorporates academic principles into the daily lesson plan, clearly identifying them for students. The evaluation component of the course tests for academic as well as vocational skills and knowledge. This model:

a. is probably the simplest way to integrate basic academic skills instruction into vocational coursework.

b. helps to "firm up" the traditionally informal reinforcement of basic academic skills in vocational classes.

c. generally stresses simple or lower level (possibly "remedial") academic skills.

d. uses vocational teachers only; it does not call for (1) interaction between academic and vocational teachers or students or (2) the meshing of academic and vocational programs.

e. includes a more formal option: the use of off-the-shelf curriculum materials that stress academic skills.

EXPERT SHEET

Model 2: Team Teaching or Turn Teaching Academic and Vocational Coursework

In this model, an academic teacher teaches a portion of a course or simply visits the class to answer questions related to academic content. The academic teacher and the vocational teacher may both be in the classroom at the same time (team teaching) or they may alternate time in the classroom (turn teaching). This model:

a. has a major strength: the collaboration between academic and vocational teachers.

b. calls for an academic teacher to be assigned to an area vocational center part- or full-time to work or team-teach with a vocational teacher.

c. calls for academic teachers to initiate the teaching of academic skills in vocational programs; the presence of the academic teacher can give status to and highlight the importance of acquiring these skills.

d. generally stresses simple or lower level (possibly "remedial") academic skills.

EXPERT SHEET

Model 3: Making Academic Curriculum More Vocationally Relevant

This model helps students better understand academic principles by allowing students to apply those principles to real world situations. For example, physics students might be allowed to visit an electronics laboratory to see, rather than just read about, how electrons flow through circuits. This model:

a. is the most popular method of integrating academic and vocational coursework: Academic teachers incorporate vocational examples into their courses.

b. allows vocational education students to sometimes (1) substitute these courses for lower level academic courses or (2) take these courses as electives.

c. is an alternative to "applied academics" courses — new courses that modify the academic curriculum specifically to incorporate vocational applications of academic principles.

d. has one primary requirement for successful integration of academic and vocational principles: linkage to vocational programs and teachers.

EXPERT SHEET

Model 4: Aligning Academic and Vocational Coursework

In this model, academic and vocational teachers reinforce the content of each other's instruction. For example, an English teacher and an automotive teacher may align their assignments to students to write a paper, the English teacher grading the paper for style and grammar and the automotive teacher grading it for content. This model:

a. has these strengths: (1) It supports the coordination of academic and vocational coursework. (2) It is highly flexible, and inexpensive to implement. (3) It increases the efficient use of teachers already on staff and the efficient delivery of course principles. (4) It increases teacher collaboration. (5) It increases cooperative learning.

b. requires changing the content of both academic and vocational courses.

c. may require changes in scheduling to synchronize the teaching of the academic and vocational subjects to be aligned.

d. incorporates elements from Model 2 (Team Teaching or Turn Teaching Academic and Vocational Coursework) and Model 3 (Making Academic Curriculum More Vocationally Relevant).

e. is sometimes facilitated through the use of materials from "applied academics" courses — new courses that modify the academic curriculum specifically to incorporate vocational applications of academic principles.

f. relies on locally developed curricula or *modified* off-the-shelf curricula.

EXPERT SHEET

Model 5: Academy Model

Academies usually operate as schools within a school. Teachers in the core academic areas (mathematics, English, and science) and the vocational teacher work together to promote student success in the vocational program. This type of integration often has students complete projects that incorporate elements from all areas taught in the academy. This model:

a. promotes teacher collaboration: A group of teachers works with one group of students and with each other consistently over a period of years.

b. allows for the development of strong relationships between the school and business and industry (mentors, speakers, tours of facilities, financial support, etc.).

c. can help motivate potential drop-outs (those performing below their potential and earning lower grades).

d. does not reduce tracking of students.

EXPERT SHEET

Model 6: Replacing Conventional Departments with Occupational Clusters, or Developing Single Focus High Schools

An example of this model is the "magnet school," which has become popular in recent years for the specialized teaching of mathematics, science, and the arts. Now, vocational magnet schools are increasing in popularity. These schools may focus on preparing students to work in the automotive, transportation, communication, or manufacturing industry. This model:

a. calls for replacing conventional departments with occupational-cluster departments; departmental personnel recommend specific course sequences, giving direction and focus to course selection.

b. promotes teacher collaboration.

c. prepares students for broad career paths.

EXPERT SHEET

Model 7: Allowing Students to Select Career Paths or Occupational Majors

This model allows each student to select a program that specifically prepares him or her for a career of personal interest. Each student's program includes both academic and vocational courses. For example, a student interested in working in the automotive industry might select an automotive technology program of physics, advanced algebra, computer technology, principles of technology, and several automotive specialty courses. This model:

a. allows students to select a "career path."

b. integrates career related information into academic subjects.

c. maintains conventional academic and vocational departments.

d. reduces the "curriculum cafeteria" approach.

e. requires each student to complete a program.

EXPERT SHEET
Content Review Sheet

Match the Description to the Model which best describes it.

Models		Description	
_____ 1.	Replacing Conventional Departments with Occupational Clusters	a.	An example: A mathematics teacher, English teacher, science teacher, and vocational teacher work together to insure student success in the vocational program.
_____ 2.	Aligning Academic and Vocational Coursework	b.	This model is designed to insure that the vocational course establishes and maintains academic standards and that academic principles are clearly identified for students.
_____ 3.	Team Teaching or Turn Teaching Academic and Vocational Coursework	c.	This approach uses real-world applications to improve the understanding of academic principles.
_____ 4.	Allowing Students to Select Career Paths or Occupational Majors	d.	Once a student selects a program, the student is required to complete a series of academic and vocational courses.
_____ 5.	Academy Model	e.	Academic teachers are used to enhance the teaching of academic content in vocational courses.
_____ 6.	Incorporating Academic Competencies into Vocational Coursework	f.	The term most frequently associated with this model is "magnet school."
_____ 7.	Making Academic Curriculum More Vocationally Relevant	g.	Academic and vocational teachers reinforce the content of each other's instruction.

EXPERT SHEET
Content Review Sheet
Answer Key

Match the Description to the Model which best describes it.

Models		Description	
F	1. Replacing Conventional Departments with Occupational Clusters	a.	An example: A mathematics teacher, English teacher, science teacher, and vocational teacher work together to insure student success in the vocational program.
G	2. Aligning Academic and Vocational Coursework	b.	This model is designed to insure that the vocational course establishes and maintains academic standards and that academic principles are clearly identified for students.
E	3. Team Teaching or Turn Teaching Academic and Vocational Coursework	c.	This approach uses real-world applications to improve the understanding of academic principles.
D	4. Allowing Students to Select Career Paths or Occupational Majors	d.	Once a student selects a program, the student is required to complete a series of academic and vocational courses.
A	5. Academy Model	e.	Academic teachers are used to enhance the teaching of academic content in vocational courses.
B	6. Incorporating Academic Competencies into Vocational Coursework	f.	The term most frequently associated with this model is "magnet school."
C	7. Making Academic Curriculum More Vocationally Relevant	g.	Academic and vocational teachers reinforce the content of each other's instruction.

Models of Integration[1]

Although the task of bridging academic and vocational education curricula is significant, natural connections exist. Common skills are needed in both sets of curricula (Dunn, 1988; Pritz, 1988). Academic skills are embedded in vocational education (Naylor, 1988; Pritz, 1988). The skills found in both curricula, such as communication skills, learning to learn skills, and problem solving skills, are neither academic nor vocational in nature (Korcheck, 1987).

Educators must restructure education to meet the needs of the labor market and the academic community. In essence, this restructuring will integrate the vocational and academic curricula into one educational enterprise (Feldman, 1987). An integrated educational enterprise will mean a change from a liberal education based upon a humanities curriculum to a liberal education based upon an applied science curriculum (Dunn, 1988).

The Processes of Integration. Integrating curricula has this result: Academic and vocational skills are taught together to increase the ability of the student to learn basic skills and apply these skills in the real world (Strumpf, 1986; Burrows, Ginn, Love, & Williams, 1989). Each curriculum, vocational and academic, can teach students important concepts. Alone, each provides a part of the content students need; together, academic and vocational contents provide a holistic educational experience (Fitzgerald, 1986; Wade & Williams, 1988). Because the difference between theory and application is often difficult for students to grasp, instruction must be redesigned to insure that acquisition and application of basic skills produces increased knowledge (Dronka, 1988; Burrows et al., 1989).

Advantages of Integration. The challenge of bridging the two curricula can be met using an applied approach to teaching basic workplace skills (Carnevale, Gainer, & Meltzer, 1988). Curricula with an integrated approach enhance learning because they accommodate the basic tenets of skills instruction. They allow for both the systematic and sequential development of information (Burrows et al., 1989). With curriculum integration, information seeking can be taught as a thinking process, with less emphasis on the tools used to find the information and raw results of the search (Burrows et al., 1989; Vocational Education, 1988; McBride, 1990).

Bottoms and Korcheck (1989) provide an excellent argument for the need to integrate academic and vocational education:

> The thinking and problem-solving skills of high school students will develop more readily if they understand the connection between what they are learning and how it can be used. One way students can achieve this insight is if meaningful applied learning activities are integrated into communication, mathematics and science courses and if essential concepts and skills from these courses are coordinated with instruction in vocational courses. Once students understand the application of academic knowledge they are far more likely to recall and apply information than if they rely on rote memorization. (p. 3)

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[1]Gloeckner, G., Cobb, B., Love, C., & Grant, B. (1992). Integrating basic skills into vocational teacher education curricula: Review of literature. Fort Collins, CO: Colorado State University.

Although Bottoms and Korcheck were referring to high school students, the concept is also finding acceptance within the medical profession. The General Professional Education of Physicians Report (cited in Cardiff, 1986) has challenged medical educators to place less emphasis on transmitting information and more emphasis on teaching students to be lifelong learners and to know how to identify and solve problems. The report promoted the use of applied courses to teach these skills.

In our public schools, many skills are taught in isolation from their application, and students are not given the opportunity to apply these skills to real world problems (Bottoms, 1989). This lack of application explains why skills learned in school do not easily transfer to the workplace (Crismore & Mikulecky, 1987). Pritz (1988) suggested that combining the teaching and application of skills will change the learning context so that academic skill achievement will be enhanced. It is expected that with enhanced skills, more students will be motivated to remain in school, high school graduates will be better equipped to perform in the workplace, and all will function better in society.

Functioning well in the future will require students to develop a clear and positive vision of themselves. That vision can be used to apply present learning to future roles (Patterson, 1985). Mote, Morton, and Marshall (1986) conducted a study using integrated curricula and instruction with rural disadvantaged youth. They found that using a personal and applied approach to instruction resulted in significant improvements in student performance. In the three years of the program, only 3% of students did not graduate from high school or receive a GED diploma. Employment results were equally impressive — 68% retained their initial jobs or moved to better positions. The control group in this study did not experience the same successes. Twenty percent dropped out of school, 10% failed to meet graduation requirements, and only 6% had jobs after graduating. Clearly, in this example, applied approaches to curricula and instruction were advantageous.

Teachers can also benefit from their involvement with integrated instruction. Vocational teachers can learn effective strategies for teaching basic skills and become better at understanding the theory that undergirds many occupational skills (Vocational Education, 1988). The entire faculty needs to be involved in developing strategies to strengthen the basic competencies of students (Dronka, 1988); when academic and vocational instructors work together to develop curriculum designed to coordinate academic skills with vocational instruction, they develop a new awareness of each others' needs and abilities. As a result, communication between instructors can improve significantly.

Phillips (1987) reported an example of this enhanced communication, in which mathematics and vocational teachers worked together to produce workbooks for vocational courses. The courses were designed to be mathematically correct and vocationally appropriate. At the end, the vocational and math instructors had a better understanding of how math is taught and applied in each other's classes.

In other studies involving similar joint efforts by vocational and academic teachers, the academic teachers learned to help students apply basic skills to careers that interested them. Additional benefits for these teachers included increased job satisfaction, increased ability to teach basics and theory, new knowledge of real world applications of theory, a more positive school climate, and acquisition of new teaching strategies (Owens & McClure, 1989; Grosvenor and Thode, 1986). Students in both academic and vocational tracks learned cooperation, increased their ability to transfer skills, enhanced their ability to see the relevance of otherwise unrelated subject matter, increased their ability to work as team members (Owens

& McClure, 1989; Budke, 1988; Burrows et al., 1989; Jurmo et al., 1989; Carnevale & Johnston, 1989; Polto & Phen, 1988) and improved their performance academically and vocationally (Bottoms, 1989; Mann, 1987; Phillips, 1987; Cardiff, 1986).

Barriers to Integration. Getting to the point that integration is the norm in school instructional programs will require the cooperation of local schools and state-level policy boards. For most schools, an effort to juxtapose or even interrelate academic and vocational education instruction will require significant changes in organizational delivery. Traditionally, the academic curriculum and the vocational curriculum have been offered in significantly different ways in terms of content, preparation of teachers, funding and administrative structure, and training environment.

For example, the typical secondary vocational education curriculum generally comprises three interrelated but discrete components: in-school skills instruction, out-of-school work experience, and participation in vocational student organizations. Preparation in the academic disciplines, or liberal arts, most often relies on in-school instruction only.

Secondary vocational education instructors often differ in their training background from almost all other groups of public school teachers. Vocational educators can teach without a baccalaureate degree in many states by gaining a credential or teaching certificate based on their related trade experience. Most states maintain a state vocational certification office distinct from the certification board of the State Department of Education.

Historically, the federal government has provided approximately 10% of total vocational education funding (Phelps, 1984). The remaining 90% has come from state and local sources (Benson & Hoachlander, 1981). While this federal share has been proportionately small, it has been significant enough to encourage all but the smallest secondary school districts to pursue those dollars. This federal-to-state-to-local flow-through funding structure has produced curricula and administrative systems that are consistent with and responsive to federal guidelines as much as to local direction. Hence, at least administratively, vocational education typically operates separate from mainstream public education, often with separate administrators, clerical personnel, budgets, and staff meetings.

Finally, secondary vocational education is delivered in four different public school environments — comprehensive high schools, general high schools, vocational high schools, and area vocational centers — while the academic curriculum uses only the first and second of these four options. The extensive use of area vocational centers and, to a lesser extent, vocational high schools, nationwide, has helped segregate vocational education delivery, thus making the integration of academic and vocational curricula difficult.

The lack of state-level policy reinforcing integrated curriculum and instructional delivery is another barrier to implementation, as is existing policy which prevents such integration (Bottoms, 1989). Other barriers include turf issues which separate state-level boards of vocational education from their counterparts in the rest of education in a variety of states (Owens & McClure, 1989), lack of documentation of the specific content each might contribute to instruction (Wade & Williams, 1988; Burrows et al., 1989) and lack of knowledge of specific competencies taught in either academic or vocational classes (Wade & Williams, 1988).

The fear of loss of positions is another barrier that must be addressed. Teachers who fear that positions will be cut due to integration are less likely to put their full support behind it. Similarly, turf issues will remain a barrier if teachers perceive that their positions on integration teams might be inequitable.

Teacher Competencies for Integration. Integration of academic and vocational education works especially well when vocational teachers have broad-based academic skills (Owens & McClure, 1989). To prepare vocational teachers for the future, teacher education programs must assure that teachers have sound basic skills and that they have some academic training in areas such as science (Owens & McClure, 1989; Bottoms, 1989). Colleges who prepare teachers must prescribe choices of electives and general study courses to assure selection of math, communication, and science for vocational teachers (Bottoms, 1989).

The skills teachers need in order to provide for the success of integration reflect those needed by today's workforce. Teaming, cooperative learning, joint planning, and interpersonal skills are examples of proficiencies needed. Teaching at both the higher education and secondary levels isolates teachers and encourages a more narrow conceptual base in the classroom. This is inevitable when a single teacher has sole responsibility for the content taught. Integration requires teachers to break that isolation by collaborating in instructional delivery (Schenka, Jensen, & Wondrasch, 1989).

Teacher preparation programs will need to concentrate on integrated approaches such as teaching prospective teachers to plan cooperatively (Grosvenor & Thode, 1986). Teachers must become sensitive to different learning styles and to a wider variety of applications (Executive Report, 1989). Teachers must develop methods to connect the teaching of needed academic competencies with related technical knowledge and skills (Bottoms, 1989; Bottoms & Korcheck, 1989). Teachers must work with employers to strengthen the link between learning in school and learning on the job (Carnevale & Johnston, 1989).

Beginning Integration. The first step to integrating curricula is to gain staff support (Naylor, 1986). The development of mutual respect among academic subject matter instructors and vocational instructors is critical. These instructors must see themselves as part of the same team (Executive Report, 1989). Reflecting this need for team-building, Miguel (1985) recommended strengthening the relationship between academic and vocational disciplines and viewing vocational programs as a way of bolstering the application of basic skills.

In the medical profession, schools have found integration to be most effective when major skills introduced are practiced in specific sequences so that the student can concentrate on one skill at a time. This process is directly related to the success of student learning (Cardiff, 1986; Kelley, Orgel, & Baer, 1985). A major requirement for program success is to make sure the coursework is correlated to a practical or clinical setting (Rose, 1988). Burrows et al. (1989) and Cardiff (1986) reported recent changes in medical curriculum, implemented so that students were placed in lifelike situations requiring them to practice the content they were learning. The traditional lecture approach, isolated from other departments, is giving way to lecture, laboratory, and discussion periods, and library research is being folded into coursework rather than assigned separately.

Dronka (1988) and Miguel (1985) reported that some students learn better through direct application of concepts than through the more traditional abstract approach. Students prefer clearly written, well organized materials with a practical emphasis (Dorsten & Smink, 1988). The Southern Regional Educational Board (SREB) of Atlanta, Georgia (Bottoms & Korcheck, 1989), suggested that vocational education coursework should be linked to academic content, and that academic content should be linked to practical vocational applications. Vocational teaching is typically able to make more explicit to students the academic foundations of their courses and, as academic teachers use more vocational

examples, students' understanding of basic skills and academic content increases (Owens & McClure, 1989).

Pucel, Devogel, & Persico (1988) suggested that integrated lessons should include practice, demonstrations, instruction on understanding procedures, feedback, evaluation, and instruction on related theory. Learning theory suggests that students learn more rapidly and retain more of what they learn when job related materials and tasks are used in instruction. It becomes necessary for teachers to observe tasks as they are performed in the workplace, to gather materials, and to develop instruction which will simulate key work elements (Drew, Mikulecky & Pershing, 1988).

Models of Integration. Many models may be followed in developing integrated approaches to the delivery of vocational and academic curriculum and instruction. Successful practices have been grouped into five categories that occur: within a single class, between two classes, across a school, beyond a school, and at the state level (Owens & McClure, 1989). In the planning stages, decisions must be made related to the structure or form of integration. Teachers can then begin to make decisions regarding instructional delivery. These delivery systems may include sharing, which refers to sharing concerns, strategies, and resource materials; teaming, which refers to sharing actual teaching responsibilities; or staff crossover, where teachers actually exchange roles with each other (Naylor, 1988; Rous & Williams, 1987).

In an integrated setting, when the delivery of academic content is to be taught by an academic teacher, a major requirement for success is making sure that the academic teacher correlates what he or she is teaching with what the vocational teacher wants done. Each academic teacher should meet regularly with the vocational teacher (Rose, 1988). Often this can be difficult to accomplish due to problems related to scheduling, location of instructors, and misalignments in the timing of similar curricular content.

An integration effort may encompass an entire school rather than just a department or a pair of teachers. The Pennsylvania Dauphin County Technical School (Rous & Williams, 1987) incorporated vocationally oriented, competency based instruction into all academic areas. They eliminated the traditional department organization and created vocational clusters. One teacher from each academic area joined each cluster. Instruction alternated between academic and vocational content.

Another popular integration method involves the use of applied academic courses. Bottoms (1989) recommends replacing general math and science courses with applied courses at the beginning of high school, and encouraging students to take more advanced courses in these disciplines. He found that vocational students who took these kinds of courses did as well on the National Assessment of Educational Progress (NAEP) science test as did students who had completed the regular academic physics course. Additional research has examined how to divide instruction among differing kinds of applied academic content. Drew et al. (1988) suggest a model of: (a) 10-20% of classroom time spent on direct personal instruction, (b) 20-30% spent on simulation practice, (c) 20-30% on general job-reading practice, and (d) 20-30% spent on related commercial materials practice.

The Agency for Instructional Technology (AIT) and the Center for Occupational Research and Development (CORD) were two of the first to design integrated academic and vocational-technical curricula. They developed the "Principles of Technology," "Applied Mathematics," and "Applied Communications" programs (Losh, Border, & Bishop, 1988). Programs like these are being developed on state and local levels and infused into schools. The "Principles of Technology" applied-physics course is the most widespread. It covers force, work, rate, resistance, energy, power, force transformers,

momentum, waves and vibrations, energy converters, transducers, and optical systems (Owens & McClure, 1989).

Bottoms (1989) has reported that achievement levels of vocational completers have significantly improved after the completion of one or more "Applied Mathematics" courses. "Applied Mathematics" covers arithmetic operations, problem solving techniques, estimation of answers, measurement skills, geometry data handling, simple statistics, and algebraic formulas. "Applied Communications" covers verbal and written communication skills needed for work (Owens & McClure, 1989).

Integrating academic and vocational disciplines will require educators to develop the relationships between their respective programs (Dronka, 1988; Rose, 1988; Wade & Williams, 1988). Thoughtful and deliberate analysis of taxonomies of learning will be required to relate academic knowledge to vocational content (Vocational Education, 1988). Vocational educators will be expected to assist academic faculty by helping to pose theoretical content in terms of working world realities (Miguel, 1985). Teachers will need to form partnerships based on a mutual commitment to providing the best curriculum for all students (Wade & Williams, 1988). This process will demand the support of local administrators, who may well be the key at both decision and institutionalization stages (Dorsten & Smink, 1988).

Liberal arts and vocational education can be integrated in many ways. Curricular integration, personnel integration, facility integration, or a combination of these can be used to provide opportunities for vocational and liberal arts or academic teachers to work together to assist students in the acquisition of basic skills.

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Jigsaw Teaching Strategy

What Is the Jigsaw Teaching Strategy?

Jigsaw is a cooperative learning strategy which is useful when covering and reviewing material. Students work in small heterogeneous learning groups, discuss with "expert" groups, and teach within the home group. The difference between Jigsaw I and II is explained below.

Why Use the Jigsaw Teaching Strategy?

The Jigsaw Strategy attempts to increase student learning by having students discuss in expert groups, help each other learn the material, and design ways they might teach the information to others. In addition, this strategy is an excellent method to reduce classroom competition and increase cooperation.

When Should You Use Jigsaw?

Jigsaw is an effective cooperative learning strategy when students are reviewing or are learning large amounts of new material. Information presented to students must be divisible: Jigsaw I requires the information to be divided into separate elements immediately; Jigsaw II allows for commonality but still requires information to be presented as distinct topics.

How to Use Jigsaw

Jigsaw I requires the teacher to form heterogeneous groups of four or five. Students are then provided with different pieces of information on a topic. Students read their information and write ideas or formulate questions about the information. Students are then regrouped into "expert" groups where they share their insights and discuss with others using the same material. Students return to their original group and teach their "expert" material.

Jigsaw II requires the teacher to form heterogeneous groups of four or five. Students are provided with common information to read. After all have read the material, students are given part of the information to develop expertise. Students are regrouped into "expert" groups for mastery development. Students return to the original groups to teach the "expert" material.

Jigsaw Teaching Strategy, continued

Things to Remember

1. The information must be capable of being divided into distinct parts.

References

Foyle, H. C., & Lyman, L. (1989, March). Cooperative learning: Research and practice. Paper presented at the Rocky Mountain Regional Conference for the Social Studies, Phoenix, AZ.

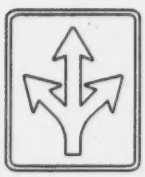
Manarino-Leggett, P., & Salomon, P. A. (1989, April). Cooperation vs. competition: Techniques for keeping your classroom alive but not endangered. Paper presented at the Annual Meeting of the International Reading Association, New Orleans, LA.

Slavin, R. E. (1988, June). Student team learning: An overview and practical guide. Washington, DC: National Education Association.

KEYS TO INTEGRATION

Perennial Problem

What should be done about integrating the new basic skills into vocational education?



Practical Problem

What should be done to promote the integration process and help remove the natural competitive barriers within schools?

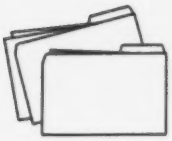
Justification for Lesson

Beginning teachers often do not realize how much they still have to learn. Similarly, experienced teachers may come to view themselves as "walking encyclopedias." Schools may exhibit these tendencies as well; those that have successfully integrated basic skills into their vocational education curriculum may "let their guard down." Each of us has a limited knowledge base. When we work in teams, we can integrate the collective knowledge of the school, the community, and larger populations. But not without resistance; a primary purpose of this lesson is to demonstrate just how difficult it is to remove the natural competitive barriers between different groups.

Learner Outcomes

The learner will create communication strategies for bridging the natural distance between different school groups.

The learner will recognize components of effective team building.

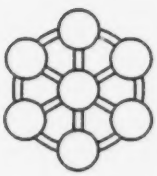


Instructor Resources

Handouts:
- The Soda Trader Rules Sheet
- The Soda Trader Scoring Sheet
- Games and Simulations Strategy

Supplies:
Eight cans of soda, four of each of two brands for each table. (Example: Each of four teams in each trading group will need one can of PEPSI and one can of COKE.)

Setting:
For this lesson, participants need to sit around a table in teams of two to three people. There should be four teams to a table.



Teaching Strategy Modeled

Games and Simulations Strategy

LESSON PLAN

Objectives:

Content:
The learner will analyze the natural barriers that work against people working in groups.

Basic Skill:
The learner will identify the new basic skills experienced in the lesson.

Process:
The learner will evaluate the use of games as a teaching strategy.

Application:
The learner will identify at least two methods to reduce competition between people in groups.

Teaching-Learning Interaction

Introduction:
Teams for this game will consist of two to three participants. Four teams, composing one trading group, will play this game around each table.

If your class has some natural divisions such as individuals focused on technology, social studies, families, etc., groups can be formed into these or other subcategories.

An alternative is to have the teams roleplay a variety of groups within a public school sector. For example, you might have a team of math teachers, a team of science teachers, a team of vocational teachers, a team of administrators, a team of parents, etc.

Learning Activities:
Step 1:
Separate the learners into four teams at a table. Each team should represent individuals from one professional area. (For example, one team may represent "Administrators.")

Note: There should be no more than three participants per team. However, there may be more than one team representing any one discipline. (For example, there may be two or more teams of "Administrators.")

The four teams at each table should represent four different professional areas. (For example, there should be only one "Administrator" team per table.)

The four teams at each table will represent one trading group. (See diagram on the handout titled The Soda Trader Rules Sheet.)

Step 2:
Pass out the handouts titled The Soda Trader Rules Sheet and The Soda Trader Scoring Sheet.

Teaching-Learning Interaction, continued

Step 3:
After a few minutes, read the following:

"All four teams must place the can to be traded on the table at the same time, when I give you the command. Your trading decision should be secret until you place your can on the table. After each round, I, as the facilitator, will give you a few seconds to record your scores and to decide as a team on your strategy for the next trade.

There are three bonus rounds: 5, 7, 10. In round 5, each team score will be multiplied by 3. In round 7, the team score will be multiplied by 5. In round 10, the team score will be multiplied by 10. After we play ten rounds, we will see which team has won the most money."

Step 4:
Begin the game and proceed through the ten rounds. Remember to multiply by the appropriate number during the bonus rounds.

Debriefing Strategies

Content:
Ask each team to select a spokesperson to review what occurred at their table. Record the team names and final scores of each of the tables in view of all students. After teams at each table have summarized their results, ask the following questions:

1. What was the purpose of this game?
2. Does this game have anything to do with integration of liberal arts and vocational education?
3. How did you feel when a team did not work toward the goal of the entire trading group at the table?
4. How does the natural competitive process that we just experienced occur within schools?
5. How does the natural competitive process that we just experienced occur within families? Does it originate there?
6. What are some ways to reduce the natural competitive nature between individuals and teams?

Debriefing Strategies, continued

Summary of Content Debriefing:
The term "they" is often used to describe a perceived opponent or antagonist. For example, vocational teachers may view academic teachers as "they": "If 'they' only appreciated the value of vocational education, integration between academic and vocational education might be possible." People are naturally competitive; when individuals come across as antagonistic, this may stem more from their natural competitiveness than from their membership in a specific group (administrators, teachers, counselors, etc.).

New Basic Skills:
What are the new basic skills you've just experienced?

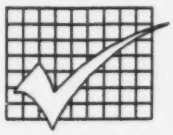
- Group effectiveness
- Influence
- Home/Family Management and Relationships

Process:
Think about the game in which you just participated:

1. Did you enjoy being a learner in a game situation?
2. Do you think a game of this nature would work in a high school setting?
3. Which do you think would be more effective in teaching this lesson (the need for cooperation in schools): a game such as The Soda Trader, or a lecture?

Distribute the handout titled Games and Simulations Strategy.

1. What is the difference between a game and a simulation?
2. How do you structure a game or simulation to make it educational?



Evaluation Options

Content:
Write a one-page paper responding to the following questions:

1. In what ways are schools structured to assist teachers' teamwork?
2. In what ways are schools structured to inhibit teachers' teamwork?

Writing Assignment—List ten ways to reduce competitive feelings between individuals and subgroups in a school setting.

Process:
Develop a lesson in your content area that uses games or simulations as a teaching strategy.

Field Experience:
Using a journal format, document the responses from an interview with at least one teacher. Ask the teacher the following questions:

1. How does this school help you work with teachers and other subgroups within the school?
2. What school activities have allowed you to be part of a team?
3. In what ways could the school help all teachers feel like team members?

Individualized Learning Plan

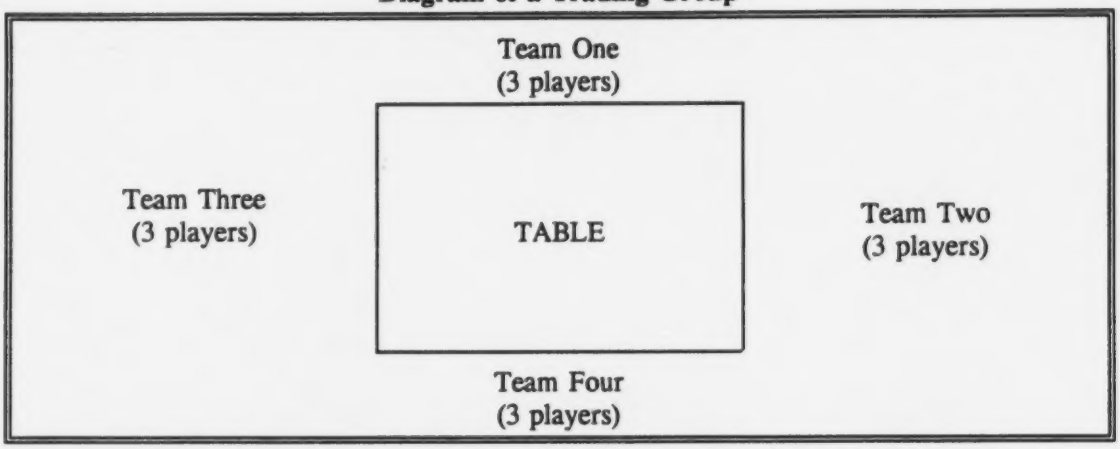
If a student is learning this content in an individualized program, the student should be given the entire lesson. The student should read all materials. The college supervisor will designate which Evaluation Options will be required of the student. To demonstrate competency, the student should prepare to teach the lesson to a group designated by the college supervisor. Suggestions for such groups include: teacher groups, service organizations, youth groups, etc.

The Soda Trader[1]
Rules Sheet

Objective:

The objective of this activity is to make as much money for your team as possible.

Diagram of a Trading Group



Rules:

At a signal from the facilitator, you and your team will reveal your decision to trade either COKE or PEPSI. Your team will make money or lose money depending on what the other three teams in your trading group decide to trade.

1. If every team decides to trade COKE, each team loses $1,000.
2. If every team decides to trade PEPSI, each team wins $1,000.
3. If one COKE and three PEPSIs are traded, the COKE wins $3,000 and the PEPSIs lose $1,000 each.
4. Any other combination causes each team to lose $1,000.

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[1]Special thanks to Michael K. Daugherty, technology teacher educator from Illinois State University, Normal, Illinois, for contributing the idea for The Soda Trader.

The Soda Trader Rules Sheet, continued

Instructions

1. Take time to familiarize yourself with the rules and scoring sheet now.
2. The facilitator will give you and your team a few seconds to record your winnings or losses after each round and to decide what your next trade will be. Your trading decision should be secret until you place your can on the table. All four teams must lay the can to be traded on the table at the same time (when the facilitator gives the command). We will play 10 rounds, then see which team has won the most money.

The Soda Trader
Scoring Sheet

Round	Reward	Balance
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Bonus Rounds:

5 - Reward x 3

7 - Reward x 5

10 - Reward x 10

Team Name: _____

Games and Simulations Strategy

What Are Games and Simulations?

Games and simulations are training devices that mimic reality very closely, but in which the complexity of events can be controlled. The primary difference between a simulation and a game is that a simulation allows the learners to perform exactly as they would in the real world. (Flight simulators and driving simulators are examples.) Games, on the other hand, are designed to have one winner and use the enthusiasm and competitive nature of individuals to help them arrive at a conclusion that is not directly related to the outcome of the game.

Why Use Games and Simulations?

Learning by doing, on-the-job training, performance assessment, and student teaching are all terms for techniques which attempt to use real world situations to teach and to assess skills and abilities. Such techniques are attractive because the learning is "real"—it is not contrived. However, most real world situations are complex and sometimes dangerous. Games and simulations can be used to make learners' tasks much less complex than they are in the real world, allowing the learners to master the tasks more easily. In addition, games and simulations permit students to learn from self-generated feedback.

When Should Teachers Use Games and Simulations?

Teachers can use games and simulations when they want to involve students in situations similar to a life experience without the complexities and possible dangers of the real world.

How to Use Games and Simulations

Teachers must judge whether the game or simulation is suitable for their students or whether modifications are necessary. Most learners enjoy their roles in a game or simulation; however, developing successful games and simulations is a difficult and time-consuming process. Following are some of Ornstein's guidelines for incorporating games and simulations into teaching:

1. Have an educational objective.
2. Keep this as your purpose: To enable students to understand the nature of a problem and how to solve it.
3. View the game or simulation as an experience for learning content in a short period of time.

Games and Simulations Strategy, continued

4. Relate the game or simulation to the content you wish to teach; clarify this content for the students.
5. Only include significant content variables, instances, or problems in the simulation.
6. Keep rules limited, concise, and clear.
7. Make sure that rules are understood with relative ease by the students, and introduce the rules in a short period of time.
8. Make the motivation for winning clear, and make the objective for how to win clear.
9. Set up the game or simulation in a way that encourages all participants to be involved.
10. Use some sort of evaluation, feedback, or discussion to determine if your objective for using the game or simulation as a teaching tool has been met.

References

Joyce, B., & Weil, M. (1986). Models of teaching. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Ornstein, A.C. (1990). Strategies for effective teaching. New York: Harper & Row, Publishers.

INSTRUCTOR RESOURCES

LESSON: CONCEPTUALIZING BASIC SKILLS

CONSENSUS STRATEGY

Problem: "What are the new basic skills?"

A. Brainstorm Possible Solutions

- no evaluation
- be creative
- record all responses on newsprint

B. Evaluate the Solutions

- review all ideas
- come to consensus on what constitutes the new basic skills

C. Make a Decision

- write down agreed-upon decision

THE NEW BASIC SKILLS[1]

- **Learning to Learn**
- **Reading, Writing, and Mathematics**
- **Communication**
- **Adaptability:** ***Creative and Critical Thinking, Problem Solving***
- **Personal Management:** ***Self-Esteem, Goal Setting/Motivation, Personal/Career Development***
- **Group Effectiveness:** ***Interpersonal Skills, Negotiation, and Teamwork***
- **Influence:** ***Organizational Effectiveness and Leadership***
- **Technology**
- **Science**
- **Home/Family Management and Relationships**

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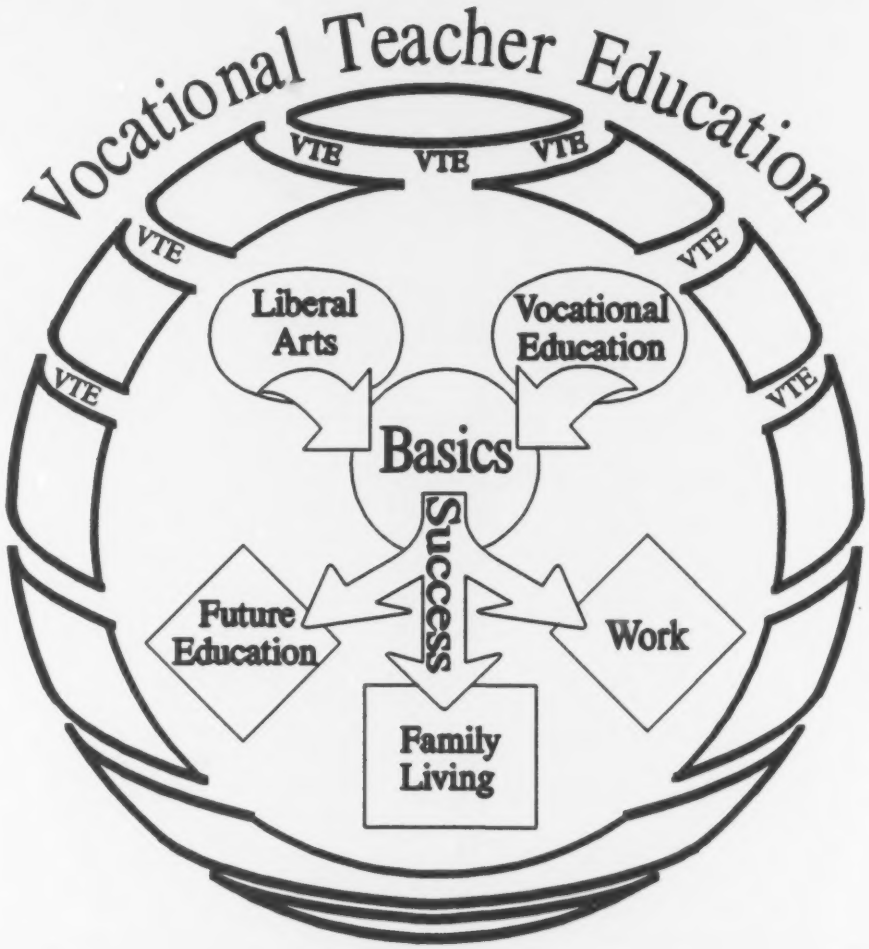
[1]Gloeckner, G., Cobb, B., Love, C., & Grant, B. (1992). Integrating basic skills into vocational teacher education curricula: Review of literature. Fort Collins, CO: Colorado State University.

Conceptual Framework for Basic Skills



Brainstorming Strategy

Brainstorming

Step 1: Gather a quantity of ideas on any subject without considering quality. (No ideas are to be criticized.)

Write ideas down (on board, overhead, etc.) where they can be seen by all.

Step 2: Participants vote to determine which of the ideas they like best (usually choosing two to three of those gathered).

Step 3: Discuss the top two to three choices in detail; the advantages and disadvantages of each should be explored.

Step 4: Take a final vote to establish the *one* idea that is liked best.

Small Group Brainstorming

Follow the same procedures listed above, with these exceptions:

Each group may present the two or three ideas it considers its best.

After all groups' ideas are listed, an elimination process may be carried out with a vote by all.

- Brainstorming is not designed for use in situations that point obviously to one best solution.
- The outcome is not predetermined by the teacher or leader.
- The group works together democratically to arrive at *a* solution, not *the* solution.

Reference

Chamberlain, V.M. (1992). Creative home economics instruction. Peoria, IL: MacMillan/McGraw-Hill School Publishing Company.

Consensus Strategy

What is the Consensus Strategy?

The Consensus Strategy is a decision making strategy in which the group aims to arrive at decisions acceptable to all, rather than imposing the will of the majority on the minority.

Why use the Consensus Strategy?

The Consensus Strategy can make everyone a "winner" in the decision making process because the views of all members of the group are considered. In addition, it is a technique which generates positive feelings and builds an atmosphere of mutual respect.

When should you use the Consensus Strategy?

Teachers can use the Consensus Strategy whenever it is important that all involved agree on a decision, solution, or plan of action.

How to use the Consensus Strategy.

The steps in consensus follow:

Brainstorm Possible Solutions.

1. It is important in brainstorming to keep from evaluating the proposals; all ideas should be accepted without requiring editing, clarification, or justification. The facilitator should encourage even "wild" or unique solutions.
2. Record all solutions (tape recorder, chalk board, newsprint) and keep things moving as quickly as possible. When the process lags, ask a refocusing question such as, "What are ways no one has thought of yet?"

Evaluate the Solutions.

1. Only when you have developed a good list of possible solutions is it appropriate to evaluate.
2. As a group, determine which solutions are the best. Cross off the list any solutions which get a negative rating from anyone for whatever reason.
3. It is important that all opinions and preferences be heard and respected. Everyone should be encouraged to advocate their proposals and to explain why their ideas have merit. Take the time to let everyone participate.

Consensus Strategy, continued

Make a Decision.

1. In some cases a clearly superior solution emerges and everyone agrees. Often, however, several high-quality solutions remain.
2. While you may take a straw vote to find out "where people are," it is important that the group not use the democratic process where "majority rules." Unless the vote is unanimous, voting produces winners and losers, and the losers will be poorly motivated to carry out the decision.
3. In exploring the proposed solutions, test them by asking participants to imagine how each solution would work if it were chosen.
4. Remember that the goal is consensus. Do not adopt a solution until everyone agrees to at least try it.
5. Write down the agreed-upon solution.

Determine How to Implement the Decision.

1. Ask the following questions: What do we need to get started? Who will be responsible for what?
2. Consider standards of performance. For example, what is a clean room?
3. Determine a time when the success of the solution will be assessed.

Solutions should allow everyone to get their needs met. When a solution fails to do so, it should be discarded and another one sought. Also, sometimes solutions to one problem create new problems, or the solutions only work for a while, so periodic assessment may be important. Remember that it is OK for a solution to fail.

Reference

Gordon, T. (1974). Teacher Effectiveness Training. New York: David McKay Company, Inc.

New Basic Skills[2]

The term "basic skills" has different meanings for different people (Dunn, 1988). It often has political currency (Miguel, 1985) with employers using the term loosely to mean a variety of work-readiness and work-related sets of skills. Basic skills are often defined as skills that were once referred to as the academic skills of reading, writing, and arithmetic (Dunn, 1988; Applying the Academics, Delaware State Department, 1989; Miguel, 1985; Owens, 1988; Strumpf, 1986; Pritz, 1988; Lee, 1988). In addition to the previously used academic definition, basic skills are also now cited as those social competencies such as the ability to balance a checkbook or read safety instructions (Dunn, 1988). Other uses of the term "basic skills" include the work attitudes found in successful workers, such as being dependable, responsible, coming to work on time, and being able to get along well with co-workers (Semple, 1987).

The literature reviewed is full of reports describing a whole new set of skills now considered to be basic. A major study by the United States Department of Labor and the American Society of Training and Development (Carnevale, Gainer, & Meltzer, 1988) documents the following as basic skills: (a) learning to learn; (b) reading, writing, and mathematics; (c) communication; (d) adaptability (creative and critical thinking and problem solving); (e) personal management (self-esteem, goal setting/motivation, and personal/career development); (f) group effectiveness (interpersonal skills, negotiation and teamwork); and (g) influence (organizational effectiveness and leadership).

Most literature on basic skills falls naturally into one or more of these categories. However, other key documents indicate a need for additional categories. For example, a more recent study funded by the U.S. Department of Labor (SCANS, 1991) includes technology as one of five key areas of basic skill competence needed by individuals in America's workplace.

Science is yet another category that appears in the literature (Knold, 1986; Bishop, 1985). Documentation focuses on the need for all Americans to have a basic understanding of science. Thus, technology and science are added as the eighth and ninth categories.

Finally, the theory of the nature of knowledge suggests a need for specific emphasis on balancing family pressures with those of education and work (Way, 1991; Kline & Cowan, 1989). Although the nine previous categories all assist in success in home and family, the literature, particularly in these two disciplines, necessitates the addition of a tenth and final category, home/family management and relationships.

The categories of basic skills reviewed in the remaining pages of this article, then, are organized around the following ten categories: (a) learning to learn; (b) reading, writing, and mathematics; (c) communication; (d) adaptability (creative and critical thinking and problem solving); (e) personal management (self-esteem, goal setting/motivation, and personal/career development); (f) group effectiveness (interpersonal skills, negotiation, and teamwork); (g) influence (organizational effectiveness and leadership); (h) technology; (i) science; and (j) home/family management and relationships.

Learning to learn. Workers must be able to assimilate new information, adapt to new technologies and prepare to be

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[2]Gloeckner, G., Cobb, B., Love, C., & Grant, B. (1992). Integrating basic skills into vocational teacher education curricula: Review of literature. Fort Collins, CO: Colorado State University.

occupationally mobile (Zuga & Lindstrom, 1989). As competition forces American industry into new patterns, workers will be required to shift from one job role to another and accept changing responsibilities. Workers will be required to absorb, process, and apply new information quickly and effectively (Carnevale et al., 1988; Champagne, 1986).

Increasingly, individuals must have a high level of integrated basic skills -- skills which reinforce each other and can be applied to changing conditions. Students will need integrated basic skills at work and elsewhere to be successful in the future (Chisman, 1989).

The ability to learn new skills is becoming more and more important (Miguel, 1985). People will need new skills in the workplace every two to three years. Learning to acquire new skills gives the worker the ability to adapt (Blai, 1989) and solve problems (Crismore & Mikulecky, 1987). Workers need to consider education as a continuous process throughout a working lifetime (Ten Recommendations for Improving Secondary Vocational Education, 1985; Champagne, 1986). Learning to learn adds transition skills which provide the ability to move easily from one occupation to another (Patterson, 1985). Learning to learn is the most basic of all skills. It is the key to unlocking future success.

Individuals who have the skill to learn and apply new skills interactively can achieve competency in all other skills from basic reading to leadership (Carnevale et al., 1988; Champagne, 1986). Learning to learn proficiency appears to be acquired through experiences within the total educational curriculum (Foodservice Subject Matter Update, 1986-87). A program with learning to learn as a priority would include a liberal arts education of reading, literature, writing, mathematics, social studies, and science. The program would also emphasize the ability to start, continue, and complete tasks within a given time (Patterson, 1985).

Reading, writing, and mathematics. Although the skills required by the workplace of the future are more complex than in previous eras, the abilities to read, write, and compute are still essential. New requirements for reading, writing, and computation, however, go beyond simple functioning. The worker will have to have the capacity to perform in the increasingly complex atmosphere of the workplace (Buskirk, 1988).

Communication. Communication skills reflect how well individuals get along and how effectively they communicate with their peers (Semple, 1987). Communication involves both verbal and nonverbal forms of communication, written expression, comprehension, speaking, listening, conversation giving, receiving instructions, and attending to others in a positive way (Fitzgerald, 1986; Carnevale & Johnston, 1989; Carnevale & Gainer, 1989a; Ten Recommendations, 1985; Bailey & Novelle, 1989; Carnevale et al., 1988). Generally, people communicate by listening and speaking. People spend a great deal of their day in some form of communication. The average person spends "8.4 percent of their time writing, 13.3 percent reading, 23 percent speaking, and 55 percent listening" (Semple, 1987, p. 11). The ability to express oneself clearly to others and listening carefully and actively are important worker competencies (Patterson, 1985). Success on the job is linked to good communications; only job knowledge ranks higher as a factor in workplace success (Semple, 1987; Welter, 1989; Carnevale et al., 1988).

Although interaction is used frequently in communication, today's employees must also develop the ability to write. Writing relies on skill abilities in the areas of analysis, conceptualization, synthesis, and distilling of information. The shift in writing skills is one from long compositions to clear, concise articulation of points and proposals (Carnevale et al., 1988).

Adaptability (creative and critical thinking and problem solving). As workers become more autonomous within the workplace (Blai, 1989), adaptability becomes more necessary. Creative and critical thinking and problem solving provide a process for making well-considered decisions. Workers will need to have the ability to generate alternatives, project outcomes, assess probabilities, and take action and risks (Carnevale et al., 1988).

Problem solving and critical and creative thinking skills include the abilities to plan, analyze, synthesize, evaluate, organize, and manage information (Patterson, 1985), and to set priorities for determining alternatives (Fitzgerald, 1986). Problem solving requires knowledge and understanding of the processes needed to apply knowledge. These skills provide the worker with the ability to detect a problem, find or invent the solutions, choose the most appropriate solutions for the conditions, and track and evaluate results (Crismore & Mikulecky, 1987).

Personal management (self-esteem, goal setting/ motivation and personal/career development). Dramatic changes in the workplace have made personal management an essential skill (Welter, 1989; Carnevale & Gainer, 1989; Berryman, 1988). Workers with these skills have the tools for understanding and expanding their skills inventories, can manage change, and are more productive in their work (Carnevale & Johnston, 1989; Pucel, Devogel, & Persico, 1988).

As the workplace continues to change and as workers become more autonomous (Blai, 1989), the need for workers to have a well developed and positive sense of self-esteem becomes critical. Self-esteem allows workers to develop confidence in their ability to do the job and to adjust as conditions change around them.

> Key components of self-esteem training include assisting employees to recognize their current skills; being aware of their impact on others; understanding their emotional set points and abilities to cope with stress, change, criticism, and so on; and dealing with their own limits by recognizing the need for and seeking new information to apply to problems and construct solutions. (Carnevale et al., 1988, p.13)

Workers with personal management skills have the awareness of themselves as individuals with talents and abilities which are marketable. They recognize the need for adding to their skill inventory and can be pro-active in dealing with the frustrations of the workplace. This skill becomes increasingly important with the increased complexity and changing demands of the workplace. Lack of these skills is often the root cause of other problems such as errors and absenteeism.

Group effectiveness (interpersonal skills, negotiation, and teamwork). Group effectiveness is the ability to work cooperatively with others (Buskirk, 1988; Carnevale & Johnston, 1989). The ability to interact with others effectively is critical when working in teams. It also is essential for service industry occupations which deal with customer complaints (Carnevale & Johnston, 1989).

As the industry increases the use of worker teams, skills in group effectiveness become increasingly important (Executive Report of the Jobs for Indiana's Future, 1989). This large category of competencies is composed of interpersonal skills, negotiation, and teamwork. Conflict is a natural condition resulting from individual differences in values and opinions. As workers are placed into more teaming situations, or as downsizing of middle management occurs, the resolution of conflict often falls to the individual worker.

Today, workers must get along with others, deal with pressures to get the job done, follow rules and policies, and have a good work attitude (Fitzgerald, 1986). These skills

include such activities as attending to others in a positive way (Fitzgerald, 1986), resolving conflict, managing stress, establishing networks with others (Patterson, 1985), and group interaction (Bailey & Novelle, 1989).

Group effectiveness skills are considered the cornerstones of successful teamwork (Carnevale et al., 1988). Due to the pooling of resources in most industries, workers are being asked to perform a multiplicity of tasks. To perform these tasks, workers must have an array of skills that individual or routine jobs do not require (Carnevale et al., 1988). Successful performance in work settings that require autonomous teams depends upon the worker's ability to interact, defuse conflict, and develop a sense of group purpose (Carnevale et al., 1988). Plihal (1989) referred to the ability to reach consensus as the "ideal speech situation" which is "characterized by freedom, equality, and openness" (p. 41).

Influence (organizational effectiveness and leadership). Influence refers to the impact of a member upon an organization. It is made up of organizational effectiveness (the ability to understand how the parts of that organization function together) and leadership (the ability to make one or many of those parts function smoothly). Workers need to have a sense of how their actions affect the ability of the organization to meet its goals (Carnevale & Johnston, 1989).

All organizations have a culture. The culture of the organization and the workers' ability to function within that culture becomes as important as specific job skills held by the worker (Carnevale et al., 1988). Armed with an understanding of what the organization values and how that is operationalized, workers will be able to become fully functioning, productive, and empowered members (Carnevale et al., 1988). Once a worker understands the organization's culture, then leadership skills can be used in positive and productive ways. To remain competitive, industry needs its employers to be able to operate within the organization and to assume responsibility and motivate others (Carnevale et al., 1988).

Technology. The Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) lists technology as one of the five key competency areas needed for the year 2000. SCANS includes three competency areas related to technology: selecting technology, applying technology to a task, and maintaining and troubleshooting equipment. Project 2061: Science for All Americans, (AAAS, 1989) identifies technology as a key area of knowledge for this and upcoming generations. It is important that technology be an integral part of the future of education for competing in a global economic environment (National Research Council, 1989; AAAS, 1989; Durenfurth & Kozak, 1991; SCANS, 1991).

Science. It was surprising to discover that many of the frequently cited national reports excluded science as a discrete category of basic skills. This review has relied heavily upon the Carnevale et al. (1988) conception of basic skills. Indeed this source is often cited by others as an exemplary "basic skills document." Given the credibility of this work it was surprising to learn that the word science is not included in the index. Similarly, the SCANS (1991) report omits science as a competency area.

Reports that omit science as an overarching competency area often include many of the competencies traditionally associated with science, such categories as: critical thinking, problem solving, interpreting, and evaluating. In an interesting contrast, other national reports focus on science as the key missing component in the United States' reduced ability to compete in a global market (AAAS, 1989; Knold, 1986; Bishop, 1985).. For these reasons, science is one of the key terms that this review uses to categorize what is meant by basic skills.

Home/Family Management and Relationships. Data from the past five years emphasize the interrelationship between success at home and success at the workplace

(Way, 1991; Kline & Cowan, 1989). Family and work are intertwined in nearly every basic skill area previously identified.

Personal management is directly related to family management (Goldsmith, 1989). Group effectiveness, influence, adaptability, communication skills, and the love of learning all begin in the home (Goldsmith, 1989). Similarly, interest in the content areas of technology, science, reading, writing, and mathematics begins in the home (Felstehausen & Schultz, 1991). For these reasons, and due to the fact that basic skills lead to success at home, in the workplace, and in education, this last category is included as part of the operational definition of basic skills.

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INSTRUCTOR RESOURCES

LESSON: MODELS OF INTEGRATION

JIGSAW II

Have the students "count off" into the size of groups appropriate for your class. As an example, if you have 25 students (5 groups of 5), have students count 1 through 5. Group 1s together, 2s together, etc. These will be your Expert Groups.

EXPERT GROUPS

11111 22222 33333 44444 55555

After Expert Groups have prepared their content, students re-group across Expert Groups. Have them report to their Cooperative Teams.

COOPERATIVE TEAMS

12345 12345 12345 12345 12345

EXPERT SHEET

Model 1: Incorporating Academic Competencies into Vocational Coursework

This model is designed to insure that the vocational course establishes and maintains academic standards. It incorporates academic principles into the daily lesson plan, clearly identifying them for students. The evaluation component of the course tests for academic as well as vocational skills and knowledge. This model:

a. is probably the simplest way to integrate basic academic skills instruction into vocational coursework.

b. helps to "firm up" the traditionally informal reinforcement of basic academic skills in vocational classes.

c. generally stresses simple or lower level (possibly "remedial") academic skills.

d. uses vocational teachers only; it does not call for (1) interaction between academic and vocational teachers or students or (2) the meshing of academic and vocational programs.

e. includes a more formal option: the use of off-the-shelf curriculum materials that stress academic skills.

EXPERT SHEET

Model 2: Team Teaching or Turn Teaching Academic and Vocational Coursework

In this model, an academic teacher teaches a portion of a course or simply visits the class to answer questions related to academic content. The academic teacher and the vocational teacher may both be in the classroom at the same time (team teaching) or they may alternate time in the classroom (turn teaching). This model:

a. has a major strength: the collaboration between academic and vocational teachers.

b. calls for an academic teacher to be assigned to an area vocational center part- or full-time to work or team-teach with a vocational teacher.

c. calls for academic teachers to initiate the teaching of academic skills in vocational programs; the presence of the academic teacher can give status to and highlight the importance of acquiring these skills.

d. generally stresses simple or lower level (possibly "remedial") academic skills.

EXPERT SHEET

Model 3: Making Academic Curriculum More Vocationally Relevant

This model helps students better understand academic principles by allowing students to apply those principles to real world situations. For example, physics students might be allowed to visit an electronics laboratory to see, rather than just read about, how electrons flow through circuits. This model:

a. is the most popular method of integrating academic and vocational coursework: Academic teachers incorporate vocational examples into their courses.

b. allows vocational education students to sometimes (1) substitute these courses for lower level academic courses or (2) take these courses as electives.

c. is an alternative to "applied academics" courses — new courses that modify the academic curriculum specifically to incorporate vocational applications of academic principles.

d. has one primary requirement for successful integration of academic and vocational principles: linkage to vocational programs and teachers.

EXPERT SHEET

Model 4: Aligning Academic and Vocational Coursework

In this model, academic and vocational teachers reinforce the content of each other's instruction. For example, an English teacher and an automotive teacher may align their assignments to students to write a paper, the English teacher grading the paper for style and grammar and the automotive teacher grading it for content. This model:

a. has these strengths: (1) It supports the coordination of academic and vocational coursework. (2) It is highly flexible, and inexpensive to implement. (3) It increases the efficient use of teachers already on staff and the efficient delivery of course principles. (4) It increases teacher collaboration. (5) It increases cooperative learning.

b. requires changing the content of both academic and vocational courses.

c. may require changes in scheduling to synchronize the teaching of the academic and vocational subjects to be aligned.

d. incorporates elements from Model 2 (Team Teaching or Turn Teaching Academic and Vocational Coursework) and Model 3 (Making Academic Curriculum More Vocationally Relevant).

e. is sometimes facilitated through the use of materials from "applied academics" courses — new courses that modify the academic curriculum specifically to incorporate vocational applications of academic principles.

f. relies on locally developed curricula or *modified* off-the-shelf curricula.

EXPERT SHEET

Model 5: Academy Model

Academies usually operate as schools within a school. Teachers in the core academic areas (mathematics, English, and science) and the vocational teacher work together to promote student success in the vocational program. This type of integration often has students complete projects that incorporate elements from all areas taught in the academy. This model:

a. promotes teacher collaboration: A group of teachers works with one group of students and with each other consistently over a period of years.

b. allows for the development of strong relationships between the school and business and industry (mentors, speakers, tours of facilities, financial support, etc.).

c. can help motivate potential drop-outs (those performing below their potential and earning lower grades).

d. does not reduce tracking of students.

EXPERT SHEET

Model 6: Replacing Conventional Departments with Occupational Clusters, or Developing Single Focus High Schools

An example of this model is the "magnet school," which has become popular in recent years for the specialized teaching of mathematics, science, and the arts. Now, vocational magnet schools are increasing in popularity. These schools may focus on preparing students to work in the automotive, transportation, communication, or manufacturing industry. This model:

a. calls for replacing conventional departments with occupational-cluster departments; departmental personnel recommend specific course sequences, giving direction and focus to course selection.

b. promotes teacher collaboration.

c. prepares students for broad career paths.

EXPERT SHEET

Model 7: Allowing Students to Select Career Paths or Occupational Majors

This model allows each student to select a program that specifically prepares him or her for a career of personal interest. Each student's program includes both academic and vocational courses. For example, a student interested in working in the automotive industry might select an automotive technology program of physics, advanced algebra, computer technology, principles of technology, and several automotive specialty courses. This model:

a. allows students to select a "career path."

b. integrates career related information into academic subjects.

c. maintains conventional academic and vocational departments.

d. reduces the "curriculum cafeteria" approach.

e. requires each student to complete a program.

EXPERT SHEET
Content Review Sheet

Match the Description to the Model which best describes it.

Models		Description	
_____ 1.	Replacing Conventional Departments with Occupational Clusters	a.	An example: A mathematics teacher, English teacher, science teacher, and vocational teacher work together to insure student success in the vocational program.
_____ 2.	Aligning Academic and Vocational Coursework	b.	This model is designed to insure that the vocational course establishes and maintains academic standards and that academic principles are clearly identified for students.
_____ 3.	Team Teaching or Turn Teaching Academic and Vocational Coursework	c.	This approach uses real-world applications to improve the understanding of academic principles.
_____ 4.	Allowing Students to Select Career Paths or Occupational Majors	d.	Once a student selects a program, the student is required to complete a series of academic and vocational courses.
_____ 5.	Academy Model	e.	Academic teachers are used to enhance the teaching of academic content in vocational courses.
_____ 6.	Incorporating Academic Competencies into Vocational Coursework	f.	The term most frequently associated with this model is "magnet school."
_____ 7.	Making Academic Curriculum More Vocationally Relevant	g.	Academic and vocational teachers reinforce the content of each other's instruction.

EXPERT SHEET
Content Review Sheet
Answer Key

Match the Description to the Model which best describes it.

Models		Description	
F	1. Replacing Conventional Departments with Occupational Clusters	a.	An example: A mathematics teacher, English teacher, science teacher, and vocational teacher work together to insure student success in the vocational program.
G	2. Aligning Academic and Vocational Coursework	b.	This model is designed to insure that the vocational course establishes and maintains academic standards and that academic principles are clearly identified for students.
E	3. Team Teaching or Turn Teaching Academic and Vocational Coursework	c.	This approach uses real-world applications to improve the understanding of academic principles.
D	4. Allowing Students to Select Career Paths or Occupational Majors	d.	Once a student selects a program, the student is required to complete a series of academic and vocational courses.
A	5. Academy Model	e.	Academic teachers are used to enhance the teaching of academic content in vocational courses.
B	6. Incorporating Academic Competencies into Vocational Coursework	f.	The term most frequently associated with this model is "magnet school."
C	7. Making Academic Curriculum More Vocationally Relevant	g.	Academic and vocational teachers reinforce the content of each other's instruction.

Models of Integration[3]

Although the task of bridging academic and vocational education curricula is significant, natural connections exist. Common skills are needed in both sets of curricula (Dunn, 1988; Pritz, 1988). Academic skills are embedded in vocational education (Naylor, 1988; Pritz, 1988). The skills found in both curricula, such as communication skills, learning to learn skills, and problem solving skills, are neither academic nor vocational in nature (Korcheck, 1987).

Educators must restructure education to meet the needs of the labor market and the academic community. In essence, this restructuring will integrate the vocational and academic curricula into one educational enterprise (Feldman, 1987). An integrated educational enterprise will mean a change from a liberal education based upon a humanities curriculum to a liberal education based upon an applied science curriculum (Dunn, 1988).

The Processes of Integration. Integrating curricula has this result: Academic and vocational skills are taught together to increase the ability of the student to learn basic skills and apply these skills in the real world (Strumpf, 1986; Burrows, Ginn, Love, & Williams, 1989). Each curriculum, vocational and academic, can teach students important concepts. Alone, each provides a part of the content students need; together, academic and vocational contents provide a holistic educational experience (Fitzgerald, 1986; Wade & Williams, 1988). Because the difference between theory and application is often difficult for students to grasp, instruction must be redesigned to insure that acquisition and application of basic skills produces increased knowledge (Dronka, 1988; Burrows et al., 1989).

Advantages of Integration. The challenge of bridging the two curricula can be met using an applied approach to teaching basic workplace skills (Carnevale, Gainer, & Meltzer, 1988). Curricula with an integrated approach enhance learning because they accommodate the basic tenets of skills instruction. They allow for both the systematic and sequential development of information (Burrows et al., 1989). With curriculum integration, information seeking can be taught as a thinking process, with less emphasis on the tools used to find the information and raw results of the search (Burrows et al., 1989; Vocational Education, 1988; McBride, 1990).

Bottoms and Korcheck (1989) provide an excellent argument for the need to integrate academic and vocational education:

> The thinking and problem-solving skills of high school students will develop more readily if they understand the connection between what they are learning and how it can be used. One way students can achieve this insight is if meaningful applied learning activities are integrated into communication, mathematics and science courses and if essential concepts and skills from these courses are coordinated with instruction in vocational courses. Once students understand the application of academic knowledge they are far more likely to recall and apply information than if they rely on rote memorization. (p. 3)

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[3]Gloeckner, G., Cobb, B., Love, C., & Grant, B. (1992). Integrating basic skills into vocational teacher education curricula: Review of literature. Fort Collins, CO: Colorado State University.

Although Bottoms and Korcheck were referring to high school students, the concept is also finding acceptance within the medical profession. The General Professional Education of Physicians Report (cited in Cardiff, 1986) has challenged medical educators to place less emphasis on transmitting information and more emphasis on teaching students to be lifelong learners and to know how to identify and solve problems. The report promoted the use of applied courses to teach these skills.

In our public schools, many skills are taught in isolation from their application, and students are not given the opportunity to apply these skills to real world problems (Bottoms, 1989). This lack of application explains why skills learned in school do not easily transfer to the workplace (Crismore & Mikulecky, 1987). Pritz (1988) suggested that combining the teaching and application of skills will change the learning context so that academic skill achievement will be enhanced. It is expected that with enhanced skills, more students will be motivated to remain in school, high school graduates will be better equipped to perform in the workplace, and all will function better in society.

Functioning well in the future will require students to develop a clear and positive vision of themselves. That vision can be used to apply present learning to future roles (Patterson, 1985). Mote, Morton, and Marshall (1986) conducted a study using integrated curricula and instruction with rural disadvantaged youth. They found that using a personal and applied approach to instruction resulted in significant improvements in student performance. In the three years of the program, only 3% of students did not graduate from high school or receive a GED diploma. Employment results were equally impressive — 68% retained their initial jobs or moved to better positions. The control group in this study did not experience the same successes. Twenty percent dropped out of school, 10% failed to meet graduation requirements, and only 6% had jobs after graduating. Clearly, in this example, applied approaches to curricula and instruction were advantageous.

Teachers can also benefit from their involvement with integrated instruction. Vocational teachers can learn effective strategies for teaching basic skills and become better at understanding the theory that undergirds many occupational skills (Vocational Education, 1988). The entire faculty needs to be involved in developing strategies to strengthen the basic competencies of students (Dronka, 1988); when academic and vocational instructors work together to develop curriculum designed to coordinate academic skills with vocational instruction, they develop a new awareness of each others' needs and abilities. As a result, communication between instructors can improve significantly.

Phillips (1987) reported an example of this enhanced communication, in which mathematics and vocational teachers worked together to produce workbooks for vocational courses. The courses were designed to be mathematically correct and vocationally appropriate. At the end, the vocational and math instructors had a better understanding of how math is taught and applied in each other's classes.

In other studies involving similar joint efforts by vocational and academic teachers, the academic teachers learned to help students apply basic skills to careers that interested them. Additional benefits for these teachers included increased job satisfaction, increased ability to teach basics and theory, new knowledge of real world applications of theory, a more positive school climate, and acquisition of new teaching strategies (Owens & McClure, 1989; Grosvenor and Thode, 1986). Students in both academic and vocational tracks learned cooperation, increased their ability to transfer skills, enhanced their ability to see the relevance of otherwise unrelated subject matter, increased their ability to work as team members (Owens & McClure, 1989; Budke, 1988; Burrows et al., 1989; Jurmo et al., 1989; Carnevale &

Johnston, 1989; Polto & Phen, 1988) and improved their performance academically and vocationally (Bottoms, 1989; Mann, 1987; Phillips, 1987; Cardiff, 1986).

Barriers to Integration. Getting to the point that integration is the norm in school instructional programs will require the cooperation of local schools and state-level policy boards. For most schools, an effort to juxtapose or even interrelate academic and vocational education instruction will require significant changes in organizational delivery. Traditionally, the academic curriculum and the vocational curriculum have been offered in significantly different ways in terms of content, preparation of teachers, funding and administrative structure, and training environment.

For example, the typical secondary vocational education curriculum generally comprises three interrelated but discrete components: in-school skills instruction, out-of-school work experience, and participation in vocational student organizations. Preparation in the academic disciplines, or liberal arts, most often relies on in-school instruction only.

Secondary vocational education instructors often differ in their training background from almost all other groups of public school teachers. Vocational educators can teach without a baccalaureate degree in many states by gaining a credential or teaching certificate based on their related trade experience. Most states maintain a state vocational certification office distinct from the certification board of the State Department of Education.

Historically, the federal government has provided approximately 10% of total vocational education funding (Phelps, 1984). The remaining 90% has come from state and local sources (Benson & Hoachlander, 1981). While this federal share has been proportionately small, it has been significant enough to encourage all but the smallest secondary school districts to pursue those dollars. This federal-to-state-to-local flow-through funding structure has produced curricula and administrative systems that are consistent with and responsive to federal guidelines as much as to local direction. Hence, at least administratively, vocational education typically operates separate from mainstream public education, often with separate administrators, clerical personnel, budgets, and staff meetings.

Finally, secondary vocational education is delivered in four different public school environments — comprehensive high schools, general high schools, vocational high schools, and area vocational centers — while the academic curriculum uses only the first and second of these four options. The extensive use of area vocational centers and, to a lesser extent, vocational high schools, nationwide, has helped segregate vocational education delivery, thus making the integration of academic and vocational curricula difficult.

The lack of state-level policy reinforcing integrated curriculum and instructional delivery is another barrier to implementation, as is existing policy which prevents such integration (Bottoms, 1989). Other barriers include turf issues which separate state-level boards of vocational education from their counterparts in the rest of education in a variety of states (Owens & McClure, 1989), lack of documentation of the specific content each might contribute to instruction (Wade & Williams, 1988; Burrows et al., 1989) and lack of knowledge of specific competencies taught in either academic or vocational classes (Wade & Williams, 1988).

The fear of loss of positions is another barrier that must be addressed. Teachers who fear that positions will be cut due to integration are less likely to put their full support behind it. Similarly, turf issues will remain a barrier if teachers perceive that their positions on integration teams might be inequitable.

Teacher Competencies for Integration. Integration of academic and vocational education works especially well when vocational teachers have broad-based academic skills (Owens & McClure, 1989). To prepare

vocational teachers for the future, teacher education programs must assure that teachers have sound basic skills and that they have some academic training in areas such as science (Owens & McClure, 1989; Bottoms, 1989). Colleges who prepare teachers must prescribe choices of electives and general study courses to assure selection of math, communication, and science for vocational teachers (Bottoms, 1989).

The skills teachers need in order to provide for the success of integration reflect those needed by today's workforce. Teaming, cooperative learning, joint planning, and interpersonal skills are examples of proficiencies needed. Teaching at both the higher education and secondary levels isolates teachers and encourages a more narrow conceptual base in the classroom. This is inevitable when a single teacher has sole responsibility for the content taught. Integration requires teachers to break that isolation by collaborating in instructional delivery (Schenka, Jensen, & Wondrasch, 1989).

Teacher preparation programs will need to concentrate on integrated approaches such as teaching prospective teachers to plan cooperatively (Grosvenor & Thode, 1986). Teachers must become sensitive to different learning styles and to a wider variety of applications (Executive Report, 1989). Teachers must develop methods to connect the teaching of needed academic competencies with related technical knowledge and skills (Bottoms, 1989; Bottoms & Korcheck, 1989). Teachers must work with employers to strengthen the link between learning in school and learning on the job (Carnevale & Johnston, 1989).

Beginning Integration. The first step to integrating curricula is to gain staff support (Naylor, 1986). The development of mutual respect among academic subject matter instructors and vocational instructors is critical. These instructors must see themselves as part of the same team (Executive Report, 1989). Reflecting this need for team-building, Miguel (1985) recommended strengthening the relationship between academic and vocational disciplines and viewing vocational programs as a way of bolstering the application of basic skills.

In the medical profession, schools have found integration to be most effective when major skills introduced are practiced in specific sequences so that the student can concentrate on one skill at a time. This process is directly related to the success of student learning (Cardiff, 1986; Kelley, Orgel, & Baer, 1985). A major requirement for program success is to make sure the coursework is correlated to a practical or clinical setting (Rose, 1988). Burrows et al. (1989) and Cardiff (1986) reported recent changes in medical curriculum, implemented so that students were placed in lifelike situations requiring them to practice the content they were learning. The traditional lecture approach, isolated from other departments, is giving way to lecture, laboratory, and discussion periods, and library research is being folded into coursework rather than assigned separately.

Dronka (1988) and Miguel (1985) reported that some students learn better through direct application of concepts than through the more traditional abstract approach. Students prefer clearly written, well organized materials with a practical emphasis (Dorsten & Smink, 1988). The Southern Regional Educational Board (SREB) of Atlanta, Georgia (Bottoms & Korcheck, 1989), suggested that vocational education coursework should be linked to academic content, and that academic content should be linked to practical vocational applications. Vocational teaching is typically able to make more explicit to students the academic foundations of their courses and, as academic teachers use more vocational examples, students' understanding of basic skills and academic content increases (Owens & McClure, 1989).

Pucel, Devogel, & Persico (1988) suggested that integrated lessons should include practice, demonstrations, instruction on understanding procedures, feedback,

evaluation, and instruction on related theory. Learning theory suggests that students learn more rapidly and retain more of what they learn when job related materials and tasks are used in instruction. It becomes necessary for teachers to observe tasks as they are performed in the workplace, to gather materials, and to develop instruction which will simulate key work elements (Drew, Mikulecky & Pershing, 1988).

Models of Integration. Many models may be followed in developing integrated approaches to the delivery of vocational and academic curriculum and instruction. Successful practices have been grouped into five categories that occur: within a single class, between two classes, across a school, beyond a school, and at the state level (Owens & McClure, 1989). In the planning stages, decisions must be made related to the structure or form of integration. Teachers can then begin to make decisions regarding instructional delivery. These delivery systems may include sharing, which refers to sharing concerns, strategies, and resource materials; teaming, which refers to sharing actual teaching responsibilities; or staff crossover, where teachers actually exchange roles with each other (Naylor, 1988; Rous & Williams, 1987).

In an integrated setting, when the delivery of academic content is to be taught by an academic teacher, a major requirement for success is making sure that the academic teacher correlates what he or she is teaching with what the vocational teacher wants done. Each academic teacher should meet regularly with the vocational teacher (Rose, 1988). Often this can be difficult to accomplish due to problems related to scheduling, location of instructors, and misalignments in the timing of similar curricular content.

An integration effort may encompass an entire school rather than just a department or a pair of teachers. The Pennsylvania Dauphin County Technical School (Rous & Williams, 1987) incorporated vocationally oriented, competency based instruction into all academic areas. They eliminated the traditional department organization and created vocational clusters. One teacher from each academic area joined each cluster. Instruction alternated between academic and vocational content.

Another popular integration method involves the use of applied academic courses. Bottoms (1989) recommends replacing general math and science courses with applied courses at the beginning of high school, and encouraging students to take more advanced courses in these disciplines. He found that vocational students who took these kinds of courses did as well on the National Assessment of Educational Progress (NAEP) science test as did students who had completed the regular academic physics course. Additional research has examined how to divide instruction among differing kinds of applied academic content. Drew et al. (1988) suggest a model of: (a) 10-20% of classroom time spent on direct personal instruction, (b) 20-30% spent on simulation practice, (c) 20-30% on general job-reading practice, and (d) 20-30% spent on related commercial materials practice.

The Agency for Instructional Technology (AIT) and the Center for Occupational Research and Development (CORD) were two of the first to design integrated academic and vocational-technical curricula. They developed the "Principles of Technology," "Applied Mathematics," and "Applied Communications" programs (Losh, Border, & Bishop, 1988). Programs like these are being developed on state and local levels and infused into schools. The "Principles of Technology" applied-physics course is the most widespread. It covers force, work, rate, resistance, energy, power, force transformers, momentum, waves and vibrations, energy converters, transducers, and optical systems (Owens & McClure, 1989).

Bottoms (1989) has reported that achievement levels of vocational completers have significantly improved after the completion of one or more "Applied Mathematics" courses. "Applied Mathematics" covers arithmetic operations,

problem solving techniques, estimation of answers, measurement skills, geometry data handling, simple statistics, and algebraic formulas. "Applied Communications" covers verbal and written communication skills needed for work (Owens & McClure, 1989).

Integrating academic and vocational disciplines will require educators to develop the relationships between their respective programs (Dronka, 1988; Rose, 1988; Wade & Williams, 1988). Thoughtful and deliberate analysis of taxonomies of learning will be required to relate academic knowledge to vocational content (Vocational Education, 1988). Vocational educators will be expected to assist academic faculty by helping to pose theoretical content in terms of working world realities (Miguel, 1985). Teachers will need to form partnerships based on a mutual commitment to providing the best curriculum for all students (Wade & Williams, 1988). This process will demand the support of local administrators, who may well be the key at both decision and institutionalization stages (Dorsten & Smink, 1988).

Liberal arts and vocational education can be integrated in many ways. Curricular integration, personnel integration, facility integration, or a combination of these can be used to provide opportunities for vocational and liberal arts or academic teachers to work together to assist students in the acquisition of basic skills.

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Jigsaw Teaching Strategy

What Is the Jigsaw Teaching Strategy?

Jigsaw is a cooperative learning strategy which is useful when covering and reviewing material. Students work in small heterogeneous learning groups, discuss with "expert" groups, and teach within the home group. The difference between Jigsaw I and II is explained below.

Why Use the Jigsaw Teaching Strategy?

The Jigsaw Strategy attempts to increase student learning by having students discuss in expert groups, help each other learn the material, and design ways they might teach the information to others. In addition, this strategy is an excellent method to reduce classroom competition and increase cooperation.

When Should You Use Jigsaw?

Jigsaw is an effective cooperative learning strategy when students are reviewing or are learning large amounts of new material. Information presented to students must be divisible: Jigsaw I requires the information to be divided into separate elements immediately; Jigsaw II allows for commonality but still requires information to be presented as distinct topics.

How to Use Jigsaw

Jigsaw I requires the teacher to form heterogeneous groups of four or five. Students are then provided with different pieces of information on a topic. Students read their information and write ideas or formulate questions about the information. Students are then regrouped into "expert" groups where they share their insights and discuss with others using the same material. Students return to their original group and teach their "expert" material.

Jigsaw II requires the teacher to form heterogeneous groups of four or five. Students are provided with common information to read. After all have read the material, students are given part of the information to develop expertise. Students are regrouped into "expert" groups for mastery development. Students return to the original groups to teach the "expert" material.

Jigsaw Teaching Strategy, continued

Things to Remember

1. The information must be capable of being divided into distinct parts.

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INSTRUCTOR RESOURCES

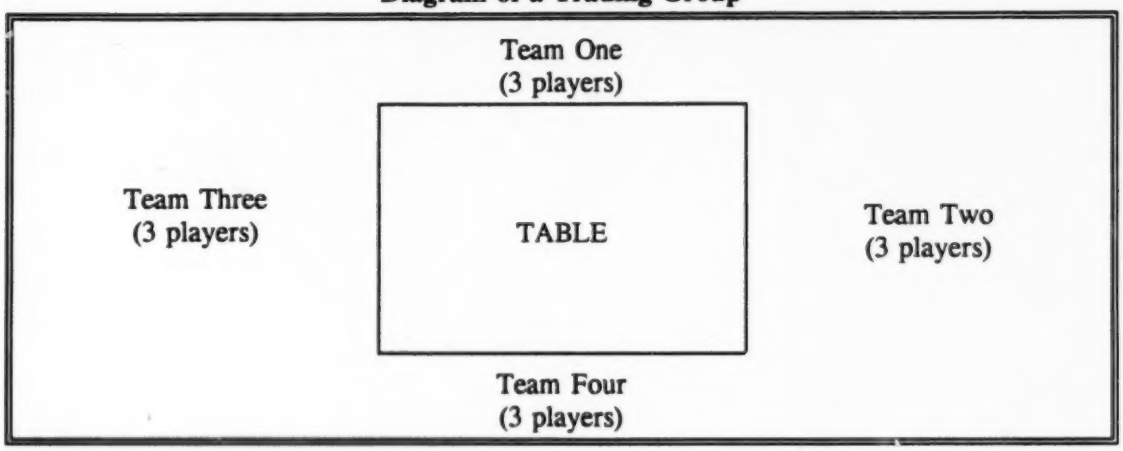
LESSON: KEYS TO INTEGRATION

The Soda Trader[4]
Rules Sheet

Objective:

The objective of this activity is to make as much money for your team as possible.

Diagram of a Trading Group



Rules:

At a signal from the facilitator, you and your team will reveal your decision to trade either COKE or PEPSI. Your team will make money or lose money depending on what the other three teams in your trading group decide to trade.

1. If every team decides to trade COKE, each team loses $1,000.
2. If every team decides to trade PEPSI, each team wins $1,000.
3. If one COKE and three PEPSIs are traded, the COKE wins $3,000 and the PEPSIs lose $1,000 each.
4. Any other combination causes each team to lose $1,000.

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[4]Special thanks to Michael K. Daugherty, technology teacher educator from Illinois State University, Normal, Illinois, for contributing the idea for The Soda Trader.

The Soda Trader Rules Sheet, continued

Instructions

1. Take time to familiarize yourself with the rules and scoring sheet now.
2. The facilitator will give you and your team a few seconds to record your winnings or losses after each round and to decide what your next trade will be. Your trading decision should be secret until you place your can on the table. All four teams must lay the can to be traded on the table at the same time (when the facilitator gives the command). We will play 10 rounds, then see which team has won the most money.

The Soda Trader
Scoring Sheet

Round	Reward	Balance
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Bonus Rounds:

5 - Reward x 3

7 - Reward x 5

10 - Reward x 10

Team Name: _____

Games and Simulations Strategy

What Are Games and Simulations?

Games and simulations are training devices that mimic reality very closely, but in which the complexity of events can be controlled. The primary difference between a simulation and a game is that a simulation allows the learners to perform exactly as they would in the real world. (Flight simulators and driving simulators are examples.) Games, on the other hand, are designed to have one winner and use the enthusiasm and competitive nature of individuals to help them arrive at a conclusion that is not directly related to the outcome of the game.

Why Use Games and Simulations?

Learning by doing, on-the-job training, performance assessment, and student teaching are all terms for techniques which attempt to use real world situations to teach and to assess skills and abilities. Such techniques are attractive because the learning is "real"—it is not contrived. However, most real world situations are complex and sometimes dangerous. Games and simulations can be used to make learners' tasks much less complex than they are in the real world, allowing the learners to master the tasks more easily. In addition, games and simulations permit students to learn from self-generated feedback.

When Should Teachers Use Games and Simulations?

Teachers can use games and simulations when they want to involve students in situations similar to a life experience without the complexities and possible dangers of the real world.

How to Use Games and Simulations

Teachers must judge whether the game or simulation is suitable for their students or whether modifications are necessary. Most learners enjoy their roles in a game or simulation; however, developing successful games and simulations is a difficult and time-consuming process. Following are some of Ornstein's guidelines for incorporating games and simulations into teaching:

1. Have an educational objective.
2. Keep this as your purpose: To enable students to understand the nature of a problem and how to solve it.
3. View the game or simulation as an experience for learning content in a short period of time.

Games and Simulations Strategy, continued

4. Relate the game or simulation to the content you wish to teach; clarify this content for the students.
5. Only include significant content variables, instances, or problems in the simulation.
6. Keep rules limited, concise, and clear.
7. Make sure that rules are understood with relative ease by the students, and introduce the rules in a short period of time.
8. Make the motivation for winning clear, and make the objective for how to win clear.
9. Set up the game or simulation in a way that encourages all participants to be involved.
10. Use some sort of evaluation, feedback, or discussion to determine if your objective for using the game or simulation as a teaching tool has been met.

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